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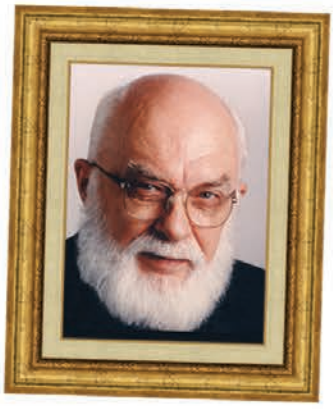

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Skepticism 2.0 What's Next?

Plus:

The 2012 Apocalypse Panic

California Nursing: State-Sponsored Snake Oil

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Editor's Note

Introducing Skepticism 2.0

There's nothing new about skepticism. People who think critically and analytically have been around since ancient times. David Hume, Benjamin Franklin, Harry Houdini, and Oskar Pfungst did brilliant skeptical investigations in earlier centuries. The modern skeptical movement, dating back to the 1970s, was led by pioneers such as Martin Gardner, Paul Kurtz, Carl Sagan, James Randi, Ray Hyman, Ken Frazier, Joe Nickell, and others—many of whom still proudly appear in these pages. The work they have done, and continue to do, has inspired and educated countless people.

Until we find a way to clone Randi and the rest (I've been told in confidence that a top-secret project to do just that has been underway since 1986 at Area 51), future generations of skeptics will need to step up, join the cause, and carry on the mission.

In fact, a new generation of skeptics is already here, with more on the way. They are the YouTube crowd, the Twitterers, and the texters of today. These kids are intelligent, critical thinkers engaged in the world around them. The challenge is to provide them with not only support but a context for their skepticism; as Shakespeare noted, "What's past is prologue." Faith healers, soothsayers, frauds, and magical thinking have always been with us and always will be. Recognizing that much of the paranormal and pseudoscience is merely old wine in new bottles arms future generations of skeptics against woo-woo.

Skepticism has found new champions with new ways of spreading its message. In this special issue, Justin Trottier discusses how to effectively communicate skepticism and science to younger generations. We have contributions by our own Barry Karr, who brings us up to date on CSI's efforts to reach out to kids. CFI librarian Timothy Binga reviews some of the best skeptical books for children and young adults, and Heidi Anderson gives a mother's perspective on raising skeptical kids.

This theme carries on in articles by the Center for Inquiry's own D.J. Grothe (on podcasts), Karen Stollznow (on blogging), Blake "Dr. Atlantis" Smith (on skeptical Web sites), and Tim Farley (on video skepticism). Reed Esau tells us about a new program called SkeptiCamp, and Daniel Loxton provides a follow-up to his insightful "Where Do We Go From Here?" essay about the future of skepticism, asking "What Do We Do Next?"

Today's teens have never known a time when Google and Wikipedia weren't available to answer any question (accurately or otherwise) with a few clicks. They didn't grow up watching *Cosmos* or *In Search Of* (or even *That's Incredible!* or *Unsolved Mysteries*). Young people remain fascinated by the paranormal and unexplained, and they are interested in the skeptical point of view when exposed to it.

Every generation has worried for the future and wrung its hands about "kids today." But I have faith in the younger generation of skeptics (not just because I'm one of them). Youths are interested, engaged, and smarter than they're often given credit for. Andrea Lunsford, a Stanford professor researching the writing habits of today's youth, has found that young people write far more than previous generations did. Much of it is in the context of online social networking (such as Facebook, MySpace, and Twitter); while this is not the same caliber of writing as analyses of themes in *Animal Farm*, this self-initiated, non-scholastic discourse is encouraging. Just as comic books, graphic novels, and *Harry Potter* books may be stepping stones to more "serious" literature, kids who instant message each other may one day be writing—or critiquing—great works.

The forms and forums are changing, but science, skepticism, and critical thinking will always be with us. Ever-grounded in the roots of skepticism, the next generation of skeptics—the activists and leaders of Skepticism 2.0—will forge paths ahead.

—Benjamin Radford, guest editor

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Moon Hoax Resolved: New Lunar Orbiter Images Show Moon Landers, Astronauts' Tracks

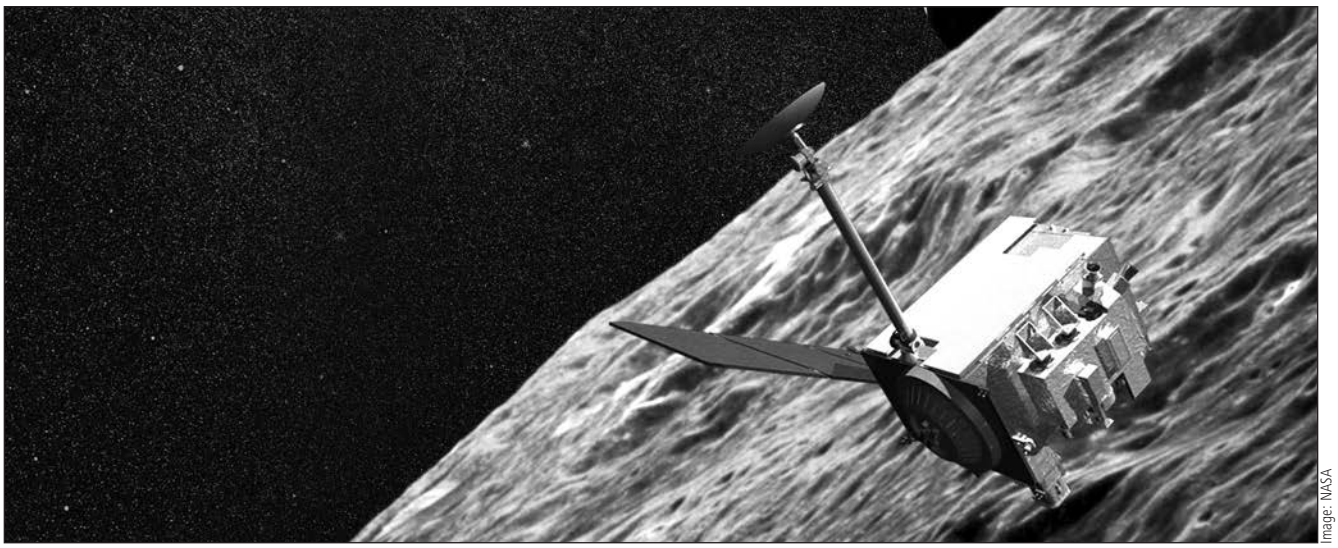


Image: NASA

Artist's conception of the Lunar Reconnaissance Orbiter with Apollo mission imagery in the background. NASA launched the Lunar Reconnaissance Orbiter (LRO) and Lunar Crater Observation and Sensing Satellite (LCROSS) on June 18, 2009.

DAVID MORRISON

Did NASA fake the Apollo landings on the Moon? This has been one of the most consistent (and outrageous) conspiracy myths of our day. At the time of the Apollo expeditions forty years ago, the world (or at least most of it) celebrated the Moon landings as a triumph of U.S. technology and human courage. Even the Soviet Union, which had been competing with the U.S. to send humans to the Moon, fully acknowledged this remarkable feat. Later, however, a small group of people began to deny that we had been to the Moon, and the Internet and cable TV amplified their claims.

The Moon hoax myth received its greatest visibility in 2001 when Fox TV broadcast an hour-long documentary that provided a platform for the arguments against Apollo. The documentary then accused NASA of a massive cover-up that included murdering several astronauts to silence them.

Opinion polls indicate that 10 percent of Americans (and higher percentages abroad) have doubts about Apollo. Others claim that the Apollo astronauts not only landed on the Moon but also discovered UFO bases there. Both of these conspiracy theories are alive and well on the Internet today.

All of the claims that the photos and video from Apollo were faked have been refuted many times over. To most people, the idea that the 400,000 people who worked on Apollo were part of a cover-up seems preposterous. No one could fake the 400 kg of lunar samples brought back, which have been studied in thousands of scientific labs all over the world. Neil Armstrong once quipped that it would have been harder to fake the Moon landings than to carry them out. In addition, the existence of retro-reflectors used to return laser pulses from the Moon clearly proves that human-made devices have been placed there.

Some of the Apollo deniers have not questioned whether spacecraft were sent to the Moon but only whether humans went there. These claims are based on

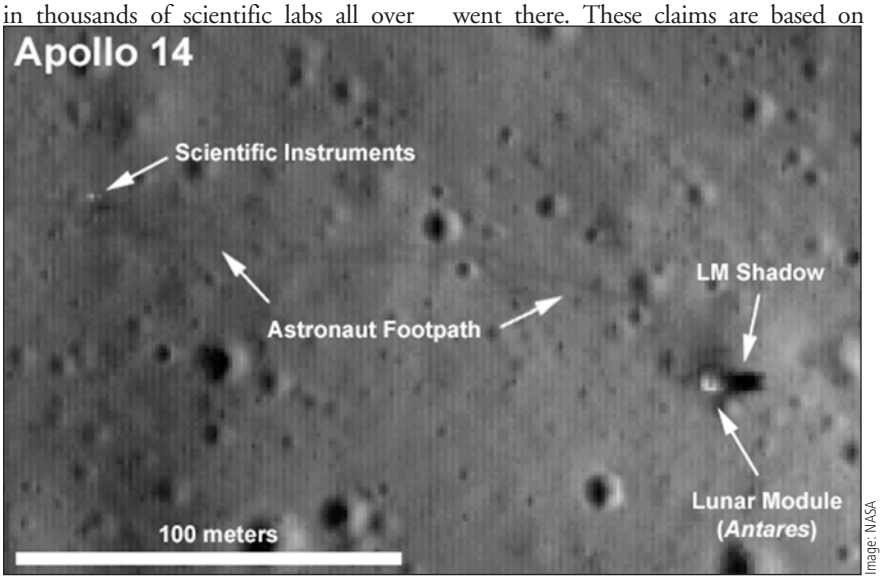


Image: NASA

NASA LROC image of the Apollo 14 landing site on the Fra Mauro formation at 1 m/pix, showing the lander and its shadow, the experiment package about 150 meters away, and the trail made by the astronauts while deploying the package.

assertions that humans would be killed by radiation exposure in space. A similar story line was used in the science fiction film *Capricorn 1*, a 1978 thriller about a Mars landing hoax. In the film, a mission goes to Mars and returns, but the astronauts remain on Earth because the life-support system is not ready to maintain humans for such a long voyage. The more sophisticated form of the Apollo conspiracy theory focuses just on the evidence proving humans were on the Moon.

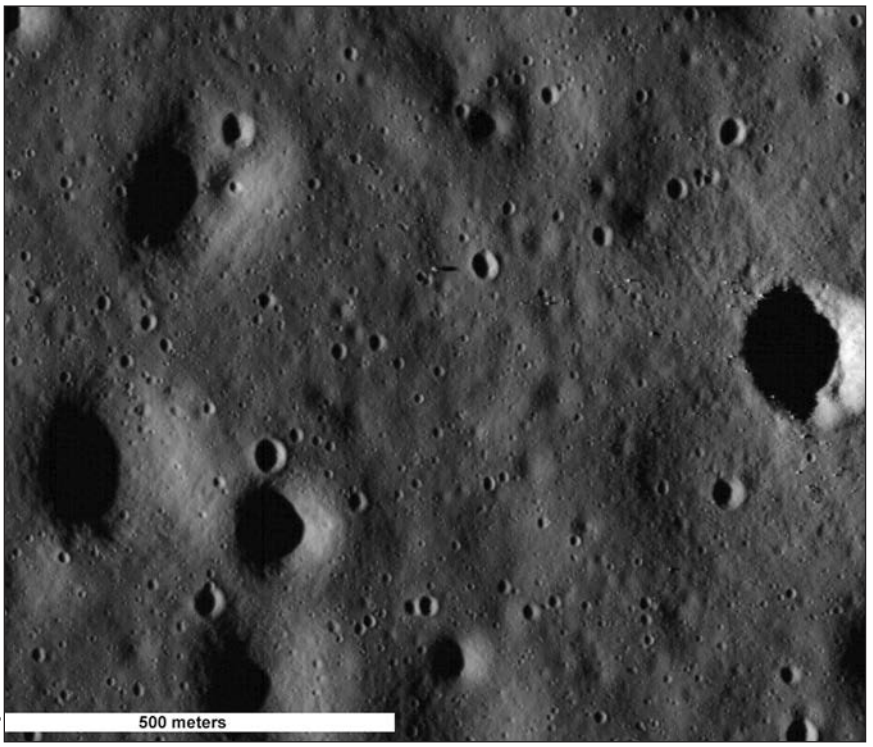


Image: NASA

NASA Lunar Reconnaissance Orbiter Camera image taken in July 2009 of the Apollo 11 landing site in Mare Tranquillitatis at 1 meter per pixel resolution, showing the lander and its shadow.

Until recently, no lunar photography has had sufficient resolution to reveal the Apollo landers or human artifacts on the surface. Earth-based telescopes don't even come close to showing such detail. The metric cameras on the Apollo Command Modules had a surface resolution of 6 m/pixel, the Clementine HIRES camera (1994) had a resolution of 7–20 m/pixel, and the Lunar Prospector orbiter (1998) did not contain a camera. Most recently, the Japanese Kaguya orbiter cameras had a resolution of a few meters, and they did detect what seems to be a bright halo around the Apollo 15 landing site, presumably caused by the plume of the lift-off rocket that returned the astronauts to lunar orbit.

The issue has now been settled by a more powerful survey tool, the NASA Lunar Reconnaissance Orbiter (LRO), which reached the Moon on June 23, 2009. After spacecraft checkout, high priority was given to photographing the Apollo landing sites using the Lunar Reconnaissance Orbiter Camera (LROC) at higher resolution than previous missions (anticipated 50 cm/pixel when it is in final orbit). Between July 11 and 15, all but one of the six Apollo landing sites were captured, most at a resolution of approximately 1 m/pixel. The Apollo 11 photo, clearly showing the lander and its shadow, was released on that mission's fortieth anniversary.

Thanks to favorable lighting and high resolution, a photo of the Apollo 14 site shows not only the lander but also the surface experiment package deployed by the astronauts. Best of all, the 150-meter path made by astronauts walking from the lander to deploy the package is also visible. This photo should convince most remaining doubters that twelve astronauts from planet Earth really did walk on our Moon four decades ago.

There are more images of the Apollo sites to come. LRO will obtain resolution at least a factor or two better and will image the sites at a variety of illumination angles. The Google Lunar X-Prize, a multimillion-dollar international competition, encourages commercial landers to photograph one or more of the Apollo sites from the surface. Nineteen industry teams are competing to be first to send small rovers to the Moon. We are sensitive, however, to the need to protect the Apollo sites as historical and cultural monuments, so don't expect any future robotic rovers or astronauts to invade the Apollo 11 site to photograph Neil Armstrong's first boot print on the Moon.

David Morrison is a fellow of the Committee for Skeptical Inquiry and director of the NASA Lunar Science Institute. He is a winner of the Carl Sagan Medal of the American Astronomical Society for science popularization, and he answers questions online from the public (many about pseudoscience) sent to NASA's Ask an Astrobiologist Web site (http://astrobiology.nasa.gov/ask-an-astrobiologist/answered/).

Psychic Exploits Horrific Abduction Case

In 1991, a young girl named Jaycee Dugard was kidnapped on her way to school. No one knew the girl's fate for eighteen years, but in late August 2009 authorities discovered her living in a virtual prison behind a couple's home in Antioch, California. She had been confined and raped, giving birth to two of her captor's children.

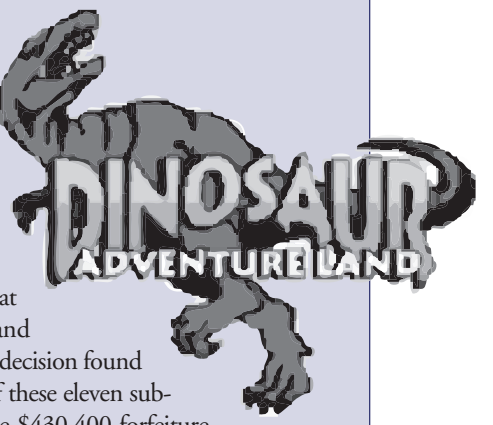
Dinosaur Adventure Land Facing Possible IRS Seizure

Flamboyant creationist Kent Hovind's seventeen-year dispute with the Internal Revenue Service is finally reaching its end, and it may spell closure for Dinosaur Adventure Land, a theme park claiming to disprove evolution and demonstrate the biblical account of Genesis as a scientific fact (see SI, March/April 2007; July/August 2006; November/December 2006; November/December 2004).

U.S. District Judge Casey Rodgers handed down a decision July 29, 2009 (Case No.: 3:09cr83/MCR), that allows the IRS to seize up to two bank accounts and ten real properties—including Dinosaur Adventure Land—in Pensacola, Florida, to satisfy the $430,400 owed to the federal government after Hovind's November 2006 conviction on fifty-eight counts of failure to pay employee taxes and threatening investigators.

With both Hovind and his wife Jo in federal prison, their son Eric continued to run Dinosaur Adventure Land on a greatly diminished schedule. Glenn Stoll, a longtime associate of the Hovinds and a renowned anti-tax activist, and Eric Hovind each filed separate appeals to the order, claiming that Stoll was owner of nine of the ten properties. The U.S. Attorney's office contended that Hovind made a series of quick transfers of the properties in order to conceal his ownership and evade seizure.

Eric Hovind's claim that one of the properties on Cummings Road is his personal residence was granted in the decision, but Stoll's claims of ownership were denied. Page 10 of the decision stated that "Stoll exercised virtually no control over the properties for which he was trustee, and the court agrees he acted as a nominal title holder for the Hovinds."



There is a possibility that Dinosaur Adventure Land could be spared because the decision found that "the combined value of these eleven substitute properties exceeds the $430,400 forfeiture amount." The decision instructed the IRS to "dispose of these forfeited properties in a piecemeal fashion and only as required to satisfy the forfeiture amount," whereupon all unsold properties would be returned to the Hovinds.

Dinosaur Adventure Land's ultimate fate now rests in the hands of the IRS.

—Greg Martinez

Greg Martinez writes from Gainesville, Florida.

The case is reminiscent of that of Josef Fritzl, an Austrian man who was discovered in 2008 to have held his daughter captive in the basement of their family home for twenty-four years. He had repeatedly physically and sexually abused her, which resulted in several children.

Within days of Dugard's recovery, a Reno, Nevada, psychic named Dayle Schear claimed that the case proved the accuracy of her abilities. Shortly after the abduction, Dugard's parents paid Schear to help locate their daughter. Though she obviously failed, Schear claims that she told Dugard's mother that eventually she would see her daughter alive again. Schear also claims that she correctly described the general area where Dugard was being held.

The psychic's assertion is typical of what happens when missing persons are eventually found, dead or alive. Yet the psychics conveniently ignore the fact that their information was either wrong or so general and vague that it was useless. Psychics come forward after the person is found to make retroactive claims about how they "knew" certain pieces of information. What police and searchers need is accurate, useful information that leads police to the victim, not the "I told you so" claims that psychics offer after the fact.

Despite repeated arguments to the contrary, there is not a single documented case of a missing person being found due solely to psychic information. In February 2004, Court TV launched a series about psychic detectives investigating cold cases called *Haunting Evidence*. The show was cancelled after three seasons without having solved a single case (see "*Haunting Evidence* Follow-Up: TV Psychic Detectives Fail Again," SI, January/February 2008).

Right now—as you are reading these words—it is virtually certain that somewhere in the world one or more children are being held in the same unimaginable conditions as Dugard. Some may die in captivity and be disposed of like trash; others will eventually be freed after physical and psychological damage.

Yet there are thousands of self-proclaimed psychics and psychic detectives in the world who profess the ability to find missing persons. Some are rich and famous, such as Allison DuBois, Noreen Renier, Carla Baron, and convicted felon Sylvia Browne. If they have the powers they claim, perhaps they could take a break from their TV appearances and lucrative lecture circuits to help find these and other desperate missing persons.

—Benjamin Radford

Benjamin Radford is managing editor of the SKEPTICAL INQUIRER *and a longtime investigator of psychic detective claims.*

Nigerian Scam Mastermind Sentenced in Australia

We've all seen the e-mails from Nigeria insisting wealth can be ours if only we help the woeful writer get his money out of the country. All he needs is a small upfront fee. . .

Now, at least one fewer person is sending out these scam appeals. One of the masterminds of a multimillion-dollar Nigerian financial scam (coordinated in Western Australia, not Nigeria) has been sentenced to six years in prison for his role in the long-running international confidence trick.

Tuoyo Clement Nikaghanri, age thirty, conducted the scams from his home in Perth, conning $132,400 from four Australian victims using elaborate scenarios. Nikaghanri, a Nigerian, is married to an Australian-born woman and possesses four passport identities. Authorities say he worked with a network of criminals between Africa, Malaysia, and Australia to carry out the scam.

"It was an absolute masterpiece with the amount of work and expertise that went into it," one victim told *The West Australian* newspaper (www.thewest.com.au). "There were all sorts of authentic-looking documentation and photographs to convince me that this was genuine."

Each victim was drawn into the fictitious financial plots through e-mails or Internet sites between 2005 and 2008 before agreeing to transfer large sums of money using Western Union accounts that Nikaghanri had set up. He then directed the money to so-called family members in Nigeria or elsewhere. It is unclear whether those recipients were real or fabricated.

"It is apparent that many foolish and gullible people are deceived and part with funds hard earned," District Court Judge Phillip Eaton said during Nikaghanri's sentencing. "All, somewhat incredibly, believed the fanciful tales that were being told."

Described as "advanced fee fraud," the scams have been launched from Nigeria for more than a decade and continue to hook people across the globe. The size of the network is difficult to quantify, but authorities believe entire Internet cafes have been manned around the clock by teams of scammers to monitor the countless spam e-mails used to hook the prey. The number of victims worldwide is likewise difficult to quantify, as most don't come forward out of hope that they will still get their money or the embarrassment of having been conned.

—Kendrick Frazier

John A. Keel, Mothman Writer, Paranormalist Trickster (1930–2009)

Noted paranormalist author John Alva Keel, best known to the public for his Mothman writings, died of a heart condition near his home in New York City on July 3. He was seventy-nine.

Born in upstate New York in 1930, Keel lived most of his life in New York City and began writing at an early age. Drafted into the U.S. Army during the Korean War, he was stationed in Europe, working on the staff of the Armed Forces Network. Upon finishing his service, Keel spent several years traveling in Egypt, the Middle East, and India, investigating "mysteries" such as the Indian rope trick, fakir tricks, and (he claims) pursuing Yeti. The result was his first book, *Jadoo* (J. Messner 1957), in which he does not actually claim these phenomena are paranormal but also does not rule out the possibility.

Keel began investigating UFO reports around 1966. He soon parted company with those who thought UFOs were extraterrestrial. No, Keel reasoned, they must be even more bizarre than that, noting the similarity of UFO-related phenomena to paranormal and religious beliefs throughout human history. In his 1970 book, *UFOs: Operation Trojan Horse* (later republished as *Why UFOs?*), Keel suggested that anomalous phenomena, such as UFOs, poltergeists, and strange creatures, were being staged by unknown intelligences. In his book *Our Haunted Planet* (1971), Keel termed these beings "ultraterrestrials." Keel claimed to have coined the phrase "Men in Black," although the stories about those sinister UFO silencers predate Keel's involvement in UFOlogy. In earlier writings, such as Gray Barker's 1956 book *They Knew Too Much About Flying Saucers*, the menacing Men in Black are simply referred to as "the three men."

Keel's 1975 book *The Mothman Prophecies* was the basis for the 2002 film of the same name. Mothman is a mysterious flying humanoid that some believe is an ultraterrestrial harbinger of doom. It was supposedly seen in parts of West Virginia a few months before a tragic bridge collapse in 1967 that claimed forty-six lives. Two characters in the 2002 film are said to be based upon Keel, illustrating different aspects of his enigmatic personality: a reporter investigating Mothman, John Kline (played by Richard Gere), and the motel operator, Mr. Leek (Keel spelled backward).

Keel tended to be solitary and reclusive, although he occasionally spoke at UFO and Fortean conferences. Some of his Fortean lectures, in which he told highly implausible tales in an entertaining and engaging manner, can be seen on YouTube. Keel often ignored people attempting to contact him, which led to several premature rumors of his death.

It should be immediately apparent to any critical reader that Keel was a trickster. His unsupported tale of Mothman trying to carry off a fully stocked Red Cross Bloodmobile is a dead giveaway to any skeptical person of his flippancy. I had a long bar conversation at a UFO conference with Keel and other luminaries of the time back in 1980. He did not seem to be taking his own writings very seriously, which suggests that they were entertaining stories that paid the bills. Those who look for deep paranormal insights in Keel's writings are taking them far more seriously than he did.

—Robert Sheaffer

Robert Sheaffer writes the SKEPTICAL INQUIRER*'s Psychic Vibrations column and is author of* UFO Sightings: The Evidence *(Prometheus 1998).*

Invasion of the Flying Saucers? Not quite. What at first may look like three giant saucer-shaped UFOs are actually lenticular clouds photographed by SI Editor Kendrick Frazier from his home and SI office in the far northeast outskirts of Albuquerque on the afternoon of June 15, 2009. About a dozen saucer-shaped lenticular clouds hovered over the city and adjacent Sandia Mountains during a good part of the day. Lenticular, or lens-shaped, clouds (scientific name *lenticularis*) can form where stable moist air flows over mountains, creating a series of large-scale standing waves downwind. The clouds are sometimes mistaken for UFOs.

CSI Launches New Web Site

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New Articles from SKEPTICAL INQUIRER Volume 33.4
July / August 2009
SKEPTICAL INQUIRER is the official journal of the Committee for Skeptical Inquiry. Six times per year Skeptical Inquirer publishes critical scientific evaluations of paranormal and fringe-science claims and informed discussion of all relevant issues. In
Skeptical Inquirer
THE HOBBIT

The Committee for Skeptical Inquiry (CSI) is proud to announce a new design and enhancements to its Web site, www.csicop.org.

The Web site was created in 1996 by volunteer Patrick Fitzgerald, starting with just basic information about the SKEPTICAL INQUIRER and CSICOP (the Committee for the Scientific Investigation of Claims of the Paranormal, CSI's former name). Over the years, more and more features were added, such as magazine content, a storefront for merchandise, and Web exclusives.

Barry Karr, executive director of CSI, states, "We've needed an overhaul of this Web site for a while, based on e-mails and talking with our subscribers."

Recently, the CSI Web development team, led by Alan Zoppa, began the redesign and update.

"This isn't just a content refresh or a redesign. The site has been nuked from orbit and rebuilt from the ground up," says Zoppa. "Today on csicop.org, you'll find a site on the bleeding edge of emerging Web standards. I've kept all our favorite articles from SKEPTICAL INQUIRER and *Skeptical Briefs* in place, but they're now cross-indexed by issue, author, and column. You can subscribe to anything or everything with RSS or watch for updates on Facebook and Twitter."

The new Web site continues to feature the publications of CSI, the SKEPTICAL INQUIRER and *Skeptical Briefs*, as well as a description of our mission. The online store and Web exclusive columns by Austin Dacey and Chris Mooney are still present as well. Some of the newer Web 2.0 technologies are featured more prominently, such as linking to Facebook and Twitter and RSS feeds that will help link up with bloggers. □

—Tim Binga

Tim Binga is the director of CFI Libraries.

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– Jacob Bronowski, scientific polymath

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Toni Van Pelt, Paul Kurtz, and Ron Lindsay (standing); Lawrence Krauss, David Helfland, and Nobel Laureate Paul Boyer (seated) introduced the Declaration in Defense of Science and Secularism at the inaugural press conference of the Center for Inquiry/Office of Public Policy in Washington, D.C.

Local leaders, campus activists, and students from around the world came together at CFI's Summer Session.

Latin American and U.S. skeptical activists met at the CFI-sponsored First Iberoamerican Conference on Critical Thinking in Peru.

The new Naturalism Research Project will more than double our library facilities and create a collegial setting for scholarly dialogue and research.

Pew/AAAS Poll: Public Likes Science but Still Disagrees with Scientists on Controversial Issues

KENDRICK FRAZIER

The public continues to like science and value scientists, but a new poll shows considerable gaps between how scientists and the public view certain science-related controversies. Public knowledge about basic scientific facts varies noticeably because people tend to better understand matters that affect their health and daily welfare. Another finding: scientists are far less religious and more politically liberal than the public.

The new poll, released in July, was conducted by the Pew Research Center in collaboration with the American Association for the Advancement of Science (AAAS). It consisted of three surveys. Opinions of the general public were gathered in two telephone surveys, one of 2,001 adults in May 2009 and the other, a science knowledge quiz, of 1,005 adults in June 2009. The survey of scientists was conducted online with a random sample of 2,533 members of the AAAS, the world's largest general scientific society, in May and June 2009. The entire poll is available online at http://people-press.org/report/528/.

People view science's effect on society positively: 84% say the effect is mostly positive; only 6% say it is mostly negative. As for how the public ranks scientists among those who contribute "a lot" to society's well-being, the numbers came out this way: members of the military, 84%; teachers, 77%; *scientists, 70%*; medical doctors, 69%; engineers, 64%; clergy, 50%; journalists, 38%; artists, 31%; lawyers, 23%; and business executives, 21%.

The twelve-item quiz revealed much about the public's science knowledge. Ninety-one percent know that aspirin is an over-the-counter drug recommended to prevent heart attacks, and 82% know that GPS technology relies on satellites. Topics covered in major news stories are also widely understood. Seventy-seven percent correctly identify earthquakes as a cause of tsunamis and 65% can identify CO^2 as a gas linked to rising temperatures. Slightly more than half (54%) know that antibiotics do not kill viruses along with bacteria, and about the same percentage (52%) know that what distinguishes stem cells from other cells is that they can develop into many different kinds of cells. Some high-school science knowledge is elusive for most Americans: fewer than half (46%) know that electrons are smaller than atoms.

Previous Pew Research Center knowledge surveys have shown that young people are poorly informed about current events and politics. But this is not the case with science knowledge. In fact, those younger than thirty get higher scores on the knowledge test than do those sixty-five and older. Still, the people most informed about science, according to the results of this quiz, are those thirty to forty-nine.

Some of the gaps between the opinions of scientists and the public about various scientific and social issues were marked. Most notably, 87% of scientists say that humans and other living things have evolved over time and that evolution is the result of natural processes such as natural selection. Just 32% of the public accept this as true.

Public Agrees Earth Is Warming but Differs with Scientists Over the Cause

View on climate change	Public Percent	Scientists Percent
Warming is due to human activity	49%	84%
Warming is due to natural changes	36%	10%
No solid evidence Earth is warming	11%	4%
Global warming is . . .		
Very serious problem	47%	70%
Somewhat serious	26%	22%
Not too serious	11%	4%
Not a problem	13%	2%

And the near-consensus about global warming among scientists is not mirrored in the general public. While 84% of the scientists polled say the earth is getting warmer because of human activity such as burning fossil fuels, just 49% of the public agree.

Kendrick Frazier is editor of the SKEPTICAL INQUIRER *and a fellow of the American Association for the Advancement of Science.*

Public Has High Regard for Science and Scientists . . .

Science's effect on society	Public Percent
Mostly positive	84%
Mostly negative	6%
Other/DK	10%
Contribute "a lot" to society's well-being	
Members of military	84%
Teachers	77%
Scientists	**70%**
Medical doctors	69%
Engineers	64%
Clergy	40%
Journalists	38%
Artists	31%
Lawyers	23%
Business executives	21%

But Public Is Less Positive than Scientists about U.S. Science

U.S. scientific achievements ...	Public Percent	Scientists Percent
Best in the world	17%	49%
Above average	47%	45%
Average	26%	5%
Below average	5%	1%
DK/No answer	4%	*

tions. Just 17% of scientists and 28% of the public say parents should be able to decide not to vaccinate their children.

The two issues that exhibit the biggest gap between scientists and the public, evolution and climate change, should be no surprise to SKEPTICAL INQUIRER readers. Also not surprising, public views on evolution are strongly linked to religion, while public views on climate change are strongly linked to political party and ideology. The poll also gives some other important details and perspectives. Americans not only diverge from the dominant scientific positions on these issues in their beliefs and attitudes, but they believe—wrongly according to the data—that the scientific community is itself divided on these issues.

The majority of the public (61%) say that human and other living things have evolved over time, but only 32% say this evolution is "due to natural processes such as natural selection," while 22% say "a supreme being guided the evolution of living things for the purpose of creating humans and other life in the form it exists today." Another 31% reject evolution and say "humans and other living things have existed in their present form since the beginning of time." Nearly all scientists (97%) say humans and other living things have evolved over time.

Differences between Public and Scientists Go Beyond Evolution

	Public Percent	Scientists Percent
Think that humans, other living things have evolved due to natural processes	32%	87%
Think that the earth is getting warmer because of human activity	49%	84%
Favor use of animals in scientific research	52%	93%
Favor federal funding for embryonic stem cell research	58%	93%
Favor building more nuclear power plants	51%	70%
Say that all parents should be required to vaccinate their children	69%	82%

More than nine-in-ten scientists (93%) favor the use of animals in scientific research, but only about half of the public (52%) agree with their use. There are also wide differences between the proportions of scientists (93%) and the public (58%) that favor federal funding for embryonic stem cell research. There is less of a schism over the need for universal vaccinations: 82% of scientists and 69% of the public at large say all children should be required to receive vaccina-

Views on evolution vary substantially within the general public, particularly by religion and attendance at religious services. A majority (57%) of white evangelical Protestants believe that humans have existed in their present form since the beginning of time. Most Catholics and white mainline Protestants say humans have evolved, though they are divided about whether this is a result of natural processes or whether evolution was guided by a supreme being. By contrast, among the religiously unaffiliated, 60% say humans have evolved due to natural processes. About half (51%) of those who say they seldom or never attend religious services say that life evolved due to natural processes, compared with 36% of those who attend services at least yearly and just 14% of those who attend weekly or more frequently.

A large majority (85%) of Americans say that the earth is warming, but they are more divided on the cause of climate change than scientists are. About half of the general public (49%) say the earth is getting warmer "mostly because of human activity, such as burning fossil fuels," while 36% say warming is occurring "mostly because of natural changes in the atmosphere." About one-in-ten (11%) say "there is no solid evidence that the earth is getting warmer." By contrast, 84% of scientists say the earth is warming because of human activity.

The strongest correlate of opinion on climate change is partisan affiliation. Two-thirds of Republicans (67%) say either that the earth is getting warmer mostly because of natural changes in the atmosphere (43%) or that there is no solid evidence the earth is getting warmer (24%). By contrast, most Democrats (64%) say the earth is getting warmer mostly because of human activity.

The divide is even larger when party and ideology are both taken into consideration. Just 21% of conservative Republicans say the earth is warming due to human activity, compared with nearly three-quarters (74%) of liberal Democrats.

Views about climate change also differ significantly by education. More than half of college graduates (58%) say climate change is occurring and is caused by human activity. Those with no more than a high school education are more divided in their opinions: 45% say the earth is warming because of human activity and 40% say it is due to natural changes in the atmosphere.

Despite the overwhelming agreement

among scientists about evolution and climate change, substantial minorities of Americans think there is no scientific consensus on these issues. While 60% of the public say that scientists generally agree that humans have evolved over time, nearly three-in-ten (28%) say that scientists do not generally agree. A comparable majority (56%) say that scientists generally agree that the earth is warming because of human activity. However, more than a third (35%) say that scientists do not generally agree.

Public's Science Knowledge

Contemporary questions	Percent correct
Aspirin recommended to prevent heart attacks	91%
GPS reliant on *satellites*	82%
Undersea earthquakes can cause tsunamis	77%
Carbon dioxide is gas linked to rising temperatures	65%
Water recently discovered on Mars	61%
Pluto no longer a planet	60%
Stem cells *can develop into many different types of cells*	52%
"Textbook" questions	
Continents are/have been shifting	76%
Not all radioactivity is man-made	63%
Antibiotics *do not* kill viruses as well as bacteria	54%
Lasers do not work by focusing sound waves	47%
Electrons are *smaller* than atoms	46%

In both cases, people's perceptions of a scientific consensus are strongly correlated with their own views on the issue. Seventy-nine percent of those who say life has evolved due to natural selection say there is a scientific consensus on this issue. Fewer than half (43%) of those who say life was created in its current form see such a consensus. This pattern is even more pronounced when it comes to views about whether there is a scientific consensus over climate change. About three-quarters (76%) of people who say human activity is driving global warming think that most scientists agree on this point.

The attitudes of the public and scientists also sharply diverge on several policy issues related to science and technology. The public is far less supportive than scientists of using animals in scientific research; about half (52%) of the general public favor this compared with 93% of scientists.

The divide is nearly as large over federal funding for embryonic stem cell research: 58% of the general public support it, compared with 93% of scientists. About half (51%) of the general public favor building additional nuclear power plants, compared with 70% of scientists. There is a smaller difference between scientists and the general public when it comes to children's vaccinations.

Religious Belief and Affiliation

*Religious belief**	Public Percent	Scientists Percent
Believe in God	83%	33%
Believe in a higher power	12%	18%
Don't believe in either	4%	41%
Religious affiliation		
Protestant	51%	20%
White Evangelical	19%	3%
Catholic	24%	10%
White non-Hispanic	15%	8%
Jewish	2%	8%
Unaffiliated	17%	48%
Atheist	2%	17%
Agnostic	2%	11%
Nothing in particular	12%	20%

*Belief figures from general public from July 2006; other general public data from Jan.–June, 2009.

Since many of these gaps are the result of the science being viewed through a political prism, it is interesting to note that scientists—at least those who are members of the AAAS—are more liberal than the general public. Slightly more than half of the scientists polled (52%) describe their own political view as liberal, including 14% who describe themselves as very liberal. Among the general public, 20% describe themselves as liberal, with just 5% calling themselves very liberal. Most scientists identify as Democrats (55%), 32% identify as independents, and just 6% say they are Republicans.

There are also big gaps between the religious views of scientists and the general public. Most Americans profess a belief in God (83%), and 82% are affiliated with a religious tradition; however, just a third of the scientists (33%) say they believe in God, 18% say they believe in a universal spirit or higher power, and 41% say they don't believe in either. Just less than half of the scientists interviewed (48%) say they have a religious affiliation, while just as many (48%) say they are not affiliated with a religious tradition.

More Scientific Consensus over Evolution and Climate Change than Public Thinks

Evolution	Percent
% of the public who says scientists generally agree that humans have evolved	60%
% of scientists who say humans have evolved	97%
Climate Change	
% of the public who says scientists generally agree that the earth is getting warmer because of human activity	56%
% of scientists who say that the earth is getting warmer because of human activity	84%

Younger scientists are substantially more likely than their older counterparts to say they believe in God. In addition, more chemists than those in other specialties say they believe in God. More men (44%) than women (36%) say they believe *neither* in God nor a higher power.

"Americans by and large admire scientists. . . .Yet researchers and the public too often are separated by a communications gap," Alan I. Leshner, chief executive officer of the AAAS, commented on the poll. "This disconnection results partly from the increasing intersection of science with issues that involve personal values and beliefs such as human embryonic stem cell research and evolution. Now more than ever, as our society faces increasing challenges,. . .the scientific community must contribute to respectful dialogue with the public." He added, "engaging with the public on scientific issues" and "listening to their perspectives, rather than lecturing to them," is needed to encourage mutual learning. □

INVESTIGATIVE FILES

JOE NICKELL

The Real Secrets of Fatima

Among the intriguing mysteries of modern Catholicism are the "miracles" and "secrets" supposedly imparted by the Virgin Mary at Fatima, Portugal, in 1917 (Oliveira 1999). In addition to an allegedly miraculous "dance of the sun," there were three major secrets, two of which were revealed at the time. The third and final one—kept in an envelope by the Vatican—was not made public until mid-2000, provoking much interest and controversy. I was involved in the media debate over the release of the third secret, appearing on a documentary for the History Channel series *History's Mysteries* titled "Fatima: Secrets Unveiled" (which aired January 4, 2001) as well as being interviewed for newspaper articles (e.g., Valpy 2000; Barss 2000). Here is my investigative take on the entire Fatima phenomenon.

Joe Nickell, PhD, is the author of numerous books, including Entities *and* Adventures in Paranormal Investigation. *Visit his Web site at www.joenickell.com.*

The Lady Appears

The reported visits of the Virgin Mary to Fatima occurred in a time of trouble. After the fall of the Portuguese monarchy in 1910, there came a wave of anti-clerical sentiment and persecution, followed by various revolutionary conflicts and Portugal's involvement in World War I.

On May 13, 1917, three shepherd children were tending their flock about two miles west of Fatima in a town near Ourém. The children were Lucia Santos, age ten, and her two cousins, nine-year-old Francisco Marto and his seven-year-old sister, Jacinta. A sudden flash of lightning sent the children fleeing down a slope, whereupon the two girls beheld the dazzling apparition of a beautiful lady, radiant in white light, standing among the holly-like leaves of a small holm oak.

Lucia was the only one who talked with the figure, who promised to identify herself at the end of a six-month period, during which time the children were to return to the site on the thirteenth day of each month. The woman said that all three of them would go to heaven but that Francisco, who could not see her, would have to recite many rosaries. When she instructed Lucia to have Francisco say the rosary, the boy became able to see the apparition, but he was still unable to hear her speak. After she instructed the children to pray for an end to the war, the lady vanished into the sky.

Even though the children had agreed that they should keep the event secret, once home, little Jacinta blurted out to her parents that she had shared in a vision of the Virgin Mary. News quickly spread throughout the town, and when the children revisited the site on June 13, they were accompanied by some fifty devout villagers. Kneeling in prayer at the oak, the children saw the woman glide down from heaven and take a position amid the oak's foliage (Arvey 1990, 66; Rogo 1982, 221–223).

Thus began a pattern that was repeated each month during the specified period, although the children were absent on August 13 (having been detained by secular authorities who disbelieved their tale and held them briefly for questioning in the public jail at Ourém). On July 13, the children claimed to have received a special revelation that the lady forbade them to disclose. The apparition remained invisible to the onlookers, but some reported seeing a little cloud rise from (or from behind) the tree, together with a movement of the tree's branches "as if in going away the Lady's dress had trailed over them" (Dacruz n.d.).

When the period ended on a stormy October 13, as many as seventy thousand people were gathered at the site anticipating the Virgin's final visit, many anticipating a great miracle. Again, the figure appeared only to the children. Identifying herself as "the Lady of the Rosary," she urged people to repent and to build a chapel at the site. After predicting an end to the war and giving the children certain undisclosed visions, the lady lifted her hands to the sky. Thereupon Lucia exclaimed, "The sun!" As everyone gazed upward to see that a silvery disc had emerged from behind the clouds, they experienced what is known in the terminology of Marian apparitions as a "sun miracle" (Arvey 1990, 69–71).

Miracle of the Sun

This Fatima "miracle" has been described in many very different ways. Some claimed that the sun spun pinwheel-like with colored streamers, while others maintained that it danced. One reported, "I saw clearly and distinctly a globe of light advancing from east to west, gliding slowly and majestically through the air." To some, the sun seemed to be falling toward the spectators. Still others, before the "dance of the sun" occurred, saw white petals shower down and disintegrate before reaching the earth (Larue

1990, 195–196; Arvey 1990, 70–71; Rogo 1982, 227, 230–232).

Precisely what happened at Fatima has been the subject of much controversy. Church authorities made inquiries, collected eyewitness testimony, and declared the events worthy of belief as a miracle (Zimdars-Swartz 1991, 90). However, people elsewhere in the world, viewing the very same sun, did not see the alleged gyrations; neither did astronomical observatories detect the sun deviating from the norm (which would have had a devastating effect on Earth!). Therefore, more tenable explanations for the reports include mass hysteria and local meteorological phenomena such as a sundog (a parhelion or "mock sun").

On the other hand, several eyewitnesses of the October 13, 1917, gathering at Fatima specifically stated they were looking "fixedly at the sun" or "tried to look straight at it" or otherwise made clear they were gazing directly at the actual sun (qtd. in Rogo 1982, 230, 231). If this is so, the "dancing sun" and other solar phenomena may have been due to optical effects resulting from temporary retinal distortion caused by staring at such an intense light or to the effect of darting the eyes to and fro to avoid fixed gazing (thus combining image, afterimage, and movement).

Most likely, there was a combination of factors, including optical effects and meteorological phenomena, such as the sun being seen through thin clouds, causing it to appear as a silver disc. Other possibilities include an alteration in the density of the passing clouds, causing the sun's image to alternately brighten and dim and so seem to advance and recede, and dust or moisture droplets in the atmosphere refracting the sunlight and thus imparting a variety of colors. The effects of suggestion were also likely involved, since devout spectators had come to the site fully expecting some miraculous event, had their gaze dramatically directed at the sun by the charismatic Lucia, and excitedly discussed and compared their perceptions in a way almost certain to foster psychological contagion (Nickell 1993, 176–181).

Not surprisingly, perhaps, sun miracles have been reported at other Marian sites—at Lubbock, Texas, in 1989; Mother Cabrini Shrine near Denver, Colorado, in 1992; Conyers, Georgia, in the early to mid-1990s; and elsewhere, including Thiruvananthapuram, India, in 2008. Tragically, at the Colorado and India sites, many people suffered eye damage (solar retinopathy)—in some instances, possibly permanent damage (Nickell 1993, 196–200; Sebastian 2008).

At the Conyers site, the Georgia Skeptics group set up a telescope outfitted with a vision-protecting Mylar solar filter, and on one occasion I participated in the experiment. Becky Long, president of the organization, stated that more than two hundred people had viewed the sun through one of the solar filters and not a single person saw anything unusual (Long 1992, 3; see figure 1).

Photo by Joe Nickel

Figure 1. At the Conyers, Georgia, Marian apparition site in 1994, skeptic Rebecca Long—using a telescope with a Mylar solar filter—looks in vain for a "sun miracle."

The Secrets

Those who believe in the Fatima "miracle" also cite certain predictions the apparition allegedly made to Lucia, one being that Jacinta and Francisco would soon die. Both did soon succumb to influenza: Francisco in 1919 and Jacinta the following year. However, Zimdars-Swartz observes, "much of what devotees today accept as the content of the apparition comes from four memoirs written by Lucia in the convent [where she later resided] between 1935 and 1941, many years after the series of experiences that constitute the apparition event" (Zimdars-Swartz 1991, 68). Indeed, Lucia recorded her first "prediction" of the children's deaths in 1927—several years after the fact!

As to the other predictions, they were supposedly part of three secrets that had been delivered to Lucia by the apparition on July 13, 1917 (Gruner 1997, 290–291). Lucia's *Third Memoir* gave the first secret as a vision of hell. The second was a statement that World War I would end, "but if people do not cease offending God, a worse one will break out during the pontificate of Pius XI" (who was pope from 1922 to 1939). However, since the *Third Memoir* was penned in August 1941, the so-called predictions were actually written after the fact (Zimdars-Swartz 1991, 198–199).

Before considering the important third secret of Fatima, and to fully comprehend the entire Fatima experience, we must look more closely at its central figure—not the Virgin Mary but Lucia de Jesus Santos. Born on March 22, 1907, to Antonio and Maria Rosa Santos, Lucia was the youngest of seven children. Five years younger than her next-oldest sibling, Lucia was a petted

and spoiled child. Her sisters fostered in her a desire to be the center of attention by teaching her to dance and sing. At festivals, Lucia would stand on a crate to entertain an adoring crowd. Among her other talents was a gift for telling stories—fairy tales, biblical narratives, and saints' legends—which made her popular with village children, as well as an ability to persuade others to do her bidding.

Two years before the famous series of apparitions occurred at Fatima, eight-year-old Lucia and three girlfriends claimed to have seen apparitions of a snow-white figure on three occasions. Lucia's mother called the experiences "childish nonsense." The following year, Lucia, Francisco, and Jacinta were thrice visited by an "angel."

Lucia's background is revealing. The seeds of her later visionary encounters were clearly contained in her childhood experiences and in her obviously fantasy-prone personality.[1] Her charismatic ability to influence others drew little Francisco and Jacinta into the Fatima fantasy. As Zimdars-Swartz says of Lucia:

> It is clear that she played the leading role in the scenario of the apparition itself. All accounts agree that she was the only one of the three seers to interact with both her vision and with the crowd, carrying on conversations with both while her two cousins stood by silently. She has said, moreover, and probably not incorrectly, that Francisco and Jacinta had been accustomed to follow her directives before the apparition began, that they turned to her for guidance afterwards, and that it was she who convinced them that they had to be very careful in their experiences. (Zimdars-Swartz 1991, 68)

Further evidence that Lucia orchestrated the fantasy and manipulated the other children is provided by certain incidents. For example, when Jacinta first told the story, she stated that the Virgin had said many things that she was unable to recall but "which Lucia knows." Lucia's own mother was convinced that her precocious daughter was, in her words, "nothing but a fake who is leading half the world astray" (qtd. in Zimdars-Swartz 1991, 71, 86).

Third Secret Revealed

But there was a third secret of Fatima, possessed by the Vatican since 1957 and the subject of endless interest and speculation (Gruner 1997, 291). Certain Catholic notables have claimed to have the third secret, but their credibility is at issue because they seem to describe documents that were not first hand in their accounts. Nevertheless, they have hinted that the text predicted another world war and a great disaster of some kind (see Kramer 2006).

Lucia's own mother was convinced that her precocious daughter was, in her words, "nothing but a fake who is leading half the world astray."

In mid-2000, the Catholic Church revealed the third secret that was supposedly imparted to Lucia in 1917, which she set down as text in a 1944 letter. It was forwarded in 1957 to the Secret Archives of the Vatican's Holy Office where it since reposed.

On Monday, June 26, 2000, Cardinal Joseph Ratzinger—then prefect of church doctrine, now Pope Benedict XVI—spoke in a nationally televised news conference at the Vatican. Scrawled with a thick-nibbed pen in Portuguese—in wording Ratzinger characterized as "symbolic and not easy to decipher" (Valpy 2000)—Lucia had described seeing (at no specific time in the future) "an angel with a flaming sword in his left hand; flashing, it gave out flames that looked as though they would set the world on fire; but they died out in contact with the splendor that Our Lady radiated towards him from her right hand: pointing to the earth with his right hand, the angel cried out in a loud voice: '*Penance, Penance, Penance!*'"

The visionary continued describing the appearance of a "bishop dressed in white," who was "afflicted with pain and sorrow" as he made his way through a ruined city. Moreover, "he prayed for the souls of the corpses he met on his way; having reached the top of the mountain, on his knees at the foot of the big Cross he was killed by a group of soldiers who fired bullets and arrows at him, and in the same way there died one after another, the other bishops, priests, men and women Religious."

Now, many of the faithful have seen the text as having forecast the attempted assassination of Pope John Paul II, who was shot and wounded by a Turk in 1981 (Fleishman 2000). However, nearly every aspect of the vision—if indeed it was supposed to predict the assassination attempt on John Paul—was in error. It described not a pope but a bishop, who was not killed, who was not shot by soldiers, certainly not by arrows (an implausibility attributable to a child's imagination); neither were all of the other bishops and priests killed.

The vision only seems accurate if one engages in "retrofitting"—after-the-fact matching that fits statements to facts once they are known. This is the same process used to claim that the prognostications of Nostradamus (1503–1566), the French seer, accurately described future events (see Nickell 1989, 45–47). In the case of the "third secret," the retrofitting involves counting the plausibly correct statements (e.g., the pope is "*Bishop* of Rome," was dressed in white, and was struck by a would-be assassin's bullet), while ignoring—or rationalizing—the many erroneous facts. Nevertheless, the Vatican statement claimed

all three secrets represented authentic prophecy: "No one could have imagined all this" (qtd. in Valpy 2000).

In any event, many conspiracy-minded Catholics refuse to believe that the third secret has been fully revealed. They opine it may be "an indictment of most of the changes in the Church since Vatican II" (held 1962–1965) and would thus cause embarrassment to the current defenders of that council (Gruner 2006, 42). Meanwhile, the visionary who started it all, Lucia Santos—who became a Carmelite nun, Sister Lúcia of Jesus, and died on February 13, 2005—has been placed on the fast track to sainthood ("Lúcia" 2008). Certainly, the story will continue. □

Acknowledgments

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Note

1. For a discussion of fantasy proneness, see Wilson and Barber 1983.

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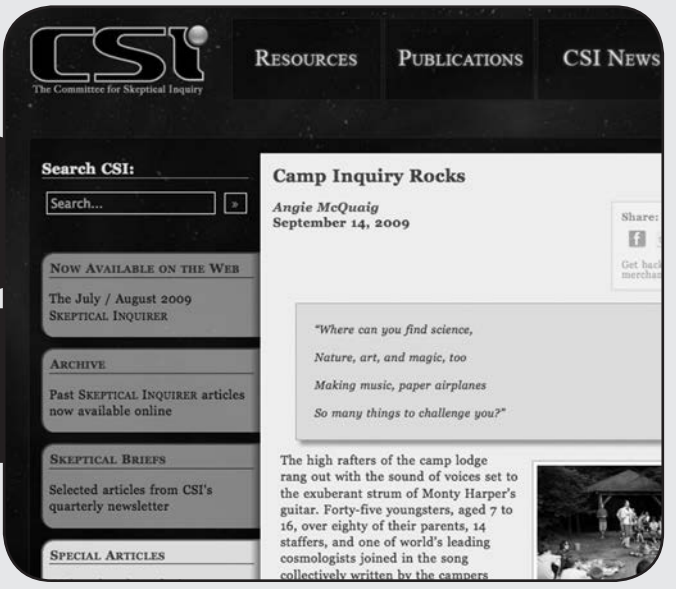
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September 14, 2009
"Where can you find science,
Nature, art, and magic, too
Making music, paper airplanes
So many things to challenge you?"
The high rafters of the camp lodge rang out with the sound of voices set to the exuberant strum of Monty Harper's guitar. Forty-five youngsters, aged 7 to 16, over eighty of their parents, 14 staffers, and one of world's leading cosmologists joined in the song collectively written by the campers

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The Moral Duty of a Skeptic

I assume that most readers of the SKEPTICAL INQUIRER think that skepticism is a good thing. Debunking the paranormal, putting psychics in their place, and generally having a good time watching Penn and Teller on *Bullshit!* may not be everyone's cup of tea (indeed, comparatively very few people enjoy it), but these days it seems like a better way to spend one's time than speculating on the financial markets. Why? What is it that makes positive skepticism not just an interesting intellectual activity but also one that carries a positive ethical connotation?

I have been thinking about this because I am periodically confronted with two issues that I am sure will sound familiar to many readers. The first one is the popular confusion between skepticism and cynicism, and the second is this tightly coupled pair of questions: "What's the harm in people believing in things that do not exist? Why do you want to take their hopes from them?"

Let us start with the confusion between skepticism and cynicism. By these terms, of course, I do not mean the two venerable philosophical traditions whose roots reach back to ancient Greece. In antiquity (and ever since in philosophy), cynics were the followers of Antisthenes (fourth century BCE) who dedicated their lives to the pursuit of nonmaterial goods. Skeptics followed Aenesidemus (first century BCE), arguing that one should suspend judgments on all matters because there is no guaranteed path to absolute truth.

What is it that makes positive skepticism not just an interesting intellectual activity but also one that carries a positive ethical connotation?

The problem is the confusion between the modern usages of these terms, when a skeptic (which should mean someone who suspends judgment until she receives and examines sufficient evidence) is thought of as a cynic in the sense of a perennial naysayer, one who might as well be characterized by the immortal quote from Groucho Marx: "Whatever it is, I'm against it!"

I submit that this confusion is just one example of the anti-intellectualism that has pervaded the United States (and which is in danger of spreading to other Western countries) since its founding (see Richard Hofstadter's classic *Anti-Intellectualism in American Life*). In this sense, skeptics suffer no different a fate than scientists or philosophers: they are perceived as boring fellows, obsessed with details, prone to dismiss others' opinions out of hand, and cosmically arrogant. The stereotype does fit some of us, of course, but in general it can be countered only with constant and patient education—not to mention good personal examples.

The second issue is thornier. It is indeed important to thoughtfully consider why we are doing what we are doing and whether our single-minded search for truth (albeit with a small "t," a distinction that the original skeptics would have appreciated) ends up doing

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more ill than good. Here the skeptic has three interrelated lines of argument at her disposal. The first one is the observation that contrary to popular belief, gullibility (the logical opposite of skepticism) literally kills. People have unnecessarily died of AIDS in South Africa and other countries because their government leaders bought into nonsense about holistic cures and Western conspiracies to spread the disease. Children in Western countries are now at risk (and several have died) because their parents do not understand the science behind vaccines and because influential public figures like Oprah Winfrey provide platforms for misinformed anti-vaccination advocates like Jenny McCarthy.

Another argument is that even when gullibility does not kill, it provides an easy way for scoundrels to take advantage of other people's feelings and swindle their money. "Mediums" like Sylvia Browne, John Edward, and James van Praagh fall into this category. I do not know for certain that these people consciously take advantage of others for financial gain; some may be genuinely convinced they have extrasensory powers (though the documented public behavior of many of these characters raises serious doubts about this charitable interpretation). It does not matter: a quack who takes people's hopes and money and delivers snake oil, even in good faith, should still be prosecuted by the law, at the very least for practicing without a license.

So far we have two practical reasons for engaging in skeptical inquiry: it can save people's lives, and it can spare them being taken advantage of, monetarily or otherwise. Yet there is a third, perhaps more arguable but ultimately more compelling, motive for spending one's time battling pseudoscience. This is the idea, forcefully espoused by Thomas Huxley ("Darwin's bulldog") and going back to the ancient Greeks, that we are ethically bound to seek the truth—and to tell others about it.

It is often difficult to make this case without engaging in delicate philosophical discussions about the nature of morality and the existence (or nonexistence) of moral facts. But there is a simpler, more immediate way of doing it. The next time you are confronted with the question "What is the harm if people believe in things that do not exist?" turn the table on your questioner. Ask him to imagine that a friend of his begins to take drugs to escape some sort of painful reality (a divorce, the loss of a job, or even simple boredom). Would he not consider it his ethical duty to help this friend realize that he is going down the wrong path? The analogy is perfectly appropriate because drugs are a way to escape the world as it really is, just like the fantasies promoted by psychics and paranormalists. Not all drugs kill, and some aren't even directly detrimental to the health of the user, just like embracing the paranormal. And yet most people, regardless of their philosophical positions, would consider it necessary to help drug users to face the world, to accept the divorce and learn from it, to get off the couch and seek a new job, or do something constructive to fight boredom.

As the character Morpheus tells Neo in *The Matrix*: "This is your last chance. After this, there is no turning back. You take the blue pill—the story ends, you wake up in your bed and believe whatever you want to believe. You take the red pill—you stay in Wonderland and I show you how deep the rabbit-hole goes." Taking the red pill is not just a crucial plot point in the movie; it is also the morally right thing to do. □

Post scriptum: While writing this column, I decided to set up an archive of compelling cases that demonstrate how gullibility is bad for your health. You can check it out at www.gullibilityisbadforyou.org.

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Eusapia Palladino, Queen of the Cabinet, Part 4

How is it possible that well-trained and respected scientists and investigators could be deceived by a clever, but sometimes clumsy, medium like Neapolitan Eusapia Palladino? It is a question worth asking when otherwise intelligent and careful researchers still fall for simple trickery today.

Let's go back to the Naples séances described in the previous installments of this column to understand what the experimenters thought when they actually caught her cheating. Even when they had evidence of fraud right in front of them, they still conceded her every extenuating circumstance and tried to save her presumed good faith, which is indicative of their degree of "skepticism."

In séance III, Eusapia was caught after having freed a hand during a substitution, and the control for her feet was not satisfactory. However, in the introductory remarks to notes on the séance, it is stated that "no deliberate conscious fraud was proved" (Feilding 1909, 378), and at the end of the entire cycle, Feilding writes (397):

> I have come, therefore, to feel it possible that, *so far as our own series of experiments is concerned*, the cases of hand-substitution practiced were innocent in intent, though obtaining our previous consent, [as] she otherwise frequently did, touch the curtain or pull it over the table . . . and did it, half automatically and without consulting us, though without any intention of producing a spurious phenomenon. It is necessary to say that never once, in the course of hundreds of phenomena, did we detect a single case of undoubted fraud, and it is my personal belief at present that though there were many phenomena which must be classed as non-evidential, there were in fact none which we should be justified in thinking to be probably spurious.

Even when the investigators had evidence of fraud right in front of them, they still conceded her every extenuating circumstance and tried to save her presumed good faith.

After séance X, still in relation to the substitution of Eusapia's hand, Feilding wrote (535):

> My own experience on this occasion, however, leads me to think it is not impossible that it is often, in the darkness, thought she had resorted to it when, in fact, she has not, and that her hands have, through weariness or carelessness, got into what may be called the "substitution position," without its being taken practical advantage of. I noticed that I only had half her hand, and immediately felt for the other half, and found it on B.'s [Baggally's] left hand. I at once jumped to the conclusion that she must have produced the touches on B.'s back with her other hand. In accordance with my promise I told her my control was not good. She agreed; but lifted my hand to feel her other hand, which I found was under B.'s right.

Eusapia was lucky that she dealt with such forgiving experimenters; she could boldly try to cheat, and in the event that she was caught they would attribute the episode to innocent distraction and give her the opportunity to correct it. The

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phrase "in accordance with my promise" from the previous passage is especially revealing. It appears odd, but the gentlemen's fair play stretched to the point of promising the medium "if ever we actually caught her tricking, at once to tell her" (437). Eusapia, then, enjoyed the incredible advantage of being able to proceed coolly with her moves because if no one spoke, she knew that no one had noticed her deception.

At séance XI, regarding an accurately performed substitution of hand, was then also grasping her thigh" (364). It is clear that such behavior could be used to the medium's advantage.

Her use of misdirection is also interesting. Eusapia would frequently hold an experimenter's hand high toward the curtain, and while the attention was on the hand she would kick the curtain below to produce movements and bulges: "Medium holds my right hand towards the left curtain with hers and makes two slow movements which are reciprocated by movements of the curtain" (353).

Because the experimenters assumed that Eusapia would not attempt fraud if she could be caught, she was free from any suspicion.

Feilding writes: "It seems difficult to suppose that her intent was fraudulent, as she must have known that in the light which prevailed a trick would have been detected"(541). Because the experimenters assumed that Eusapia would not attempt fraud if she could be caught, she was free from any suspicion.

A Subtle Use of Psychology

There are various psychological aspects to consider regarding the conditions under which the Feilding group operated. We have already discussed the experimenters' submission to the medium and their wish never to irritate her. This, of course, had an influence on the kind of control they possessed: "The degree of control permitted by her varied very much, and appeared to depend upon her mood" (323).

Eusapia used other psychological ruses as well. For example, a much longer treatise would be needed to fully discuss her use of sexual movements: "as a rule she is apparently overwhelmed by sleep, throws herself often into the arms of her neighbours" (324); "sometimes she encircled the leg of one of the controllers tightly between her own or rested both her legs across his knees" (327); "medium asks us to put our hands on her legs" (352); "my right hand

Here is a description of an attempt at misdirection to cover a foot substitution, which was detected by the skillful experimenters at Columbia University (Houdini 1924, 56–57):

> We were next favored with responsive raps—doubling up her hands she beat the air with her fists in a jerky, spasmodic way when we heard the light noises on the wood. The exhibition above board did not occupy our entire attention. Every one in the party was interested in the theory of using a foot as a lever to raise the table. As she beat the air with her clenched fist, she correspondingly slid her feet away until we felt the pressure on the toe end of our feet only, whereas there had previously been pressure on the insteps. Kellog and I both suspected that she had succeeded in removing one foot and was making the other do duty for two.

The two magicians hiding under the table later confirmed that this had taken place.

Finally, Eusapia tried hard to appear cooperative, doing her best to make the experimenters happy. For example, she would ask for better light only to have her "control," John King, refuse it: "In the early stages of trance the directions for dimunition of the light are usually given through tilts or levitations (sometimes apparently without contact) of the table. Eusapia herself frequently opposes these directions, but as a rule the table continues, by repeated series of five tilts, often of great violence, to demand a reduction of light to which she ultimately gives way" (Feilding 1909, 325).

Throughout the report, there are many instances in which she appears to cooperate only to then have things go her way: "Eusapia was in a nervous, anxious mood, perpetually interrupting to ask if the control was satisfactory, and perpetually rendering it as difficult as possible for us to make it so" (325–326).

In Closing

Despite my long examination of Eusapia Palladino's séances, it is not possible to conclude whether she was a genuine medium or not. However, I can observe two things: 1) her best demonstrations were held with no real controls and before people who were ignorant of trickery methods; 2) competent researchers invariably determined that she was using trickery.

Many have claimed that the best experiments conducted on Eusapia's séances are those by the Feilding group. However, in light of their reports, we can consider the Feilding committee a group of highly incompetent researchers.

On the basis of these observations, I strongly suspect that Eusapia Palladino depended on her highly polished and rehearsed methods of deception for her living and probably did not need an accomplice in order to achieve any of the 470 phenomena described in the report. The gullibility of her experimenters and their will to believe was enough. □

Acknowledgments

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NOTES OF A FRINGE-WATCHER

MARTIN GARDNER

Bill Maher: Crank and Comic

Well-known stand-up comic Bill Maher has joined the ranks of the Big-D atheists, Richard Dawkins and Daniel Dennett, and the Big-H atheists, Christopher Hitchens and Sam Harris, as an implacable foe of all religions. However, instead of writing a book, Maher produced the very funny documentary *Religulous*. While it has been blasted by followers of all faiths, secular humanists have hailed it as a masterpiece of rhetoric.

Maher was born in New York City in 1956 to a Roman Catholic father and Jewish mother but grew up in New Jersey. After graduating from Cornell, he began a highly successful career as a comedian.

In his first television show, *Politically Incorrect*, Maher exchanged banter with various celebrities. After carelessly remarking on the show that the September 11 terrorists were brave men (meaning that they were courageous to die for their cause), ABC canceled the show's contract. Maher soon began a new show called *Real Time with Bill Maher*, which is still doing well on HBO. He was also a writer for the *Roseanne* television series and has appeared in numerous films.

Politically, Maher is an outspoken liberal with many libertarian views, such as favoring legalization of prostitution and marijuana. His attacks on conservative Republicans are merciless (e.g., he called Sarah Palin a "category 5 moron"). Philosophically, he prefers to call himself an agnostic rather than an atheist because he accepts the possibility of some sort of transcendental force or intelligence superior to our own.

In addition to his well-known disbelief in God, Maher also rejects modern medical science. He is firmly persuaded that almost all ills, including diseases, are the result of bad eating habits. "We eat shit," he likes to say. As for germs, he believes they play no role in our illnesses. As a result, Maher is strongly opposed to all vaccines. He even denies that the Salk vaccine played any role in the decline of polio! Here is what he said in an interview:

> [Germ theory] is another theory I think is flawed. And that we go by the Louis Pasteur theory even though Pasteur renounced it on his death bed and said Beauchamp is right. It's not the invading germs. It's the terrain. It's not the mosquitoes. It's the swamp that they're breeding in.

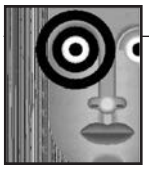
Maher is referring to Antoine Beauchamp, a French biologist who opposed Pasteur's germ theory. The claim that Pasteur renounced his theory on his death bed is pure mythology. A surgeon who posts remarks on the Internet under the pseudonym Orac referred to this myth as one "routinely parroted by credulous idiots like Bill Maher."

Maher told Larry King that he never takes aspirin because, like all other drugs, he thinks it's harmful. Owners of the big drug companies are evil men because they bilk the public with expensive and worthless drugs. On the *Late Show with David Letterman* he advised Letterman, then recovering from quadruple bypass surgery, to stop taking the "harmful" pills his doctor had prescribed.

Too bad Mary Baker Eddy believed in both God and Christ; otherwise, Bill Maher might have become a Christian Scientist. Fortunately, he has no children he could let die because of his refusal to vaccinate or because he would not accept medicine from a doctor in cahoots with those dreadful pharmaceutical companies that make and sell worthless products.

Let Orac have the final word: "I used to kind of like Maher," he wrote, "but I really think that as he gets older he's getting flakier and flakier." □

Martin Gardner is author of more than seventy books, most recently The Jinn from Hyperspace *and* When You Were a Tadpole and I was a Fish, and Other Speculations About This and That, *published by Hill and Wang in October 2009.*



The Myth of the Walking Tree

Q: While on a tour of the rainforest during a recent vacation in Central America, our guide showed us a tree with a very unusual root system. He said that it is called a "walking tree" and can actually move along the ground in search of light. I know plants grow toward sunlight, but can trees "walk?"

—C. Ayles

A: The walking tree, or walking palm (*Socratea exorrhiza*), has very curious roots. While most trees have one trunk, the palm splits into a dozen or more small roots a few feet off the ground. With so many "legs," the tree looks ready to wander off.

The just-so story of how the walking tree got its name is apparently widely believed. Indeed, no less an authoritative source than Wikipedia states that the walking tree's "common name arises from the fact that the tree's stilt roots enable it to slowly shift position, up to one meter a year to get more sunlight."

One small publishing company was even named after it. According to the Web site of Walking Tree Press, "The Walking Tree of the Amazon jungle has the unusual ability to 'walk' on aerial roots, which serve as 'legs.' Inspired by a need for more light, the tree lets roots on one side die off and grows new ones in the direction it wants to go. In this manner, the Walking Tree moves up to seven feet a year. At Walking Tree Press we believe that if a tree can decide to make a change and move in a new direction, we humans should certainly be able to do the same."

Having spent time in jungles, I have seen such trees before but had never heard the story behind them. The idea has some plausibility on its face—plants do grow toward sunlight—and the rainforest is home to many unusual plants. But a tree that *walks*?

I searched for scientific studies on the walking palm, curious to see just how well documented the "walking" was; perhaps I could even find time-lapse videos of the trees sauntering across the jungle floor. If they encountered a half-buried boulder during their walk, would the walking trees trip? And if they did, would they fall very, very slowly?

These fanciful notions were quickly quashed when I read a study by biologist Gerardo Avalos, director of the Center for Sustainable Development Studies in Atenas, Costa Rica. His article on the function of the walking palm's root structure was quite detailed but didn't mention anything about walking. I contacted Avalos, and he gamely replied:

> My *Biotropica* paper proves that the belief of the walking palm is just a myth. . . . The development and distribution of stilt roots is a character[istic] that is size-related. Stilt roots maintain the mechanical stability of the palm tree (which can reach well over twenty meters [sixty-five feet] in height). Thinking that a palm tree could actually track canopy light changes by moving slowly over the forest floor . . . is a myth that tourist guides find amusing to tell visitors to the rainforest. For one thing, a large cone of stilt roots takes a long time to develop. Changes in canopy light conditions are more dynamic, with holes in the canopy being open at the same time that others are closed. There is little possibility for a match in the development of a structural characteristic so complex, relative to the dynamics of light changes in the canopy.

Avalos also referenced a more recent study that came to the same conclusions (Goldsmith 2007). As interesting as it would be to think that when no one is around trees walk the rainforest floor, it is a mere myth. □

Acknowledgments

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The Paradoxical Future of Skepticism

DANIEL LOXTON

Like many skeptics, I'm preoccupied by one question: "How do we take this thing to the next level?" I have an answer to propose. If skepticism is truly to come of age, to move forward—if skepticism is really to help—we must embrace a kind of paradox. In my opinion, the road ahead is both more amateur and more professional.

In the early days, skepticism was like a trail through the deep woods. Traditional skeptics' organizations were the only guides; by publishing skeptical magazines and books, organizations effectively *were* skepticism. As skepticism attracted more people, an oxymoron began to emerge: skepticism became a sort of centrally controlled popular movement. This situation was tied to technology, and it was destined to change.

It takes funded organizations to promote skepticism through expensive, high-risk means such as magazines and printed books. By contrast, the past decade (and the past five years in particular) have brought digital communication tools that make publishing and networking easy and cheap for grassroots skeptics everywhere. No longer restricted to specialist organizations, the trail is now shared by the thousands of amateur enthusiasts, social networks, and independent projects that make up the popular movement of skepticism.

This changes everything. It's true that digital outreach may bring new grassroots support to traditional skeptical organizations, but realizing that potential requires facing up to a more fundamental shift: traditional skeptical organizations are no longer the default leaders of the popular movement. Indeed, new skeptics may not even realize the traditional skeptical groups exist.

The new wave of skeptics is comprised of children of the Internet who find skepticism first through online sources (such as iTunes or Google) where they happen across independent skeptical efforts (blogs like Pharyngula or podcasts like *The Skeptics Guide to the Universe*). From there they branch off to other online sources (other podcasts, especially) and communities (such as the James Randi Educational Foundation [JREF] Forum or the skeptical presence within social networks like Facebook or Twitter).

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For these skeptics, traditional print sources (like *Skeptic* or the SKEPTICAL INQUIRER) are not the automatic flagships of skepticism but rather afterthoughts—perhaps welcome as further reading but frequently off the radar altogether. Explosive grassroots growth thus comes at a cost. New skeptics may have little-to-no knowledge of the decades-long literature and hard-won lessons of skepticism. Some may not even be interested in learning about it. Nonetheless, communication technologies allow anyone to mouth off in the name of "skepticism," even with minimal experience or expertise. This can lower the bar for quality, tarnish our public face, and offer further cover for fringe pseudo-skeptical elements (such as climate change deniers). That's the bad news; an amateur movement is necessarily burdened with some degree of amateurism.

But the good news is so good that it's worth almost any cost: thousands of people are actively taking up the call to skeptical activism in a distributed-yet-networked fashion that is qualitatively different from all that has come before. Many are young (astonishingly, given the traditional demographics of skepticism), and many are women. Some are natural, powerful new leaders who might never have discovered skepticism without the new digital tools. All bring their ideas—some of which are spectacularly good ideas—to the table.

The Change Is Upon Us

This change has already happened. How can traditional groups come to grips with this new distributed grassroots skepticism?

For some, an essential step must be to give up on the dream of a unified, centralized rationalist movement—and to give up the hard feelings and sense of schism that was so often the result. Personally, I don't believe that unification was ever particularly desirable, but in any event, that ship has sailed. Or, rather, ships: the reality we are faced with is a flotilla of national, regional, and local skeptical organizations (plus all manner of humanist, atheist, and rationalist groups) moving independently and chaotically yet roughly in parallel. Some groups are larger and more influential than others, of course—there are aircraft carriers as well as rowboats—but the variety of organizations, efforts, projects, and mandates is dizzying. Traveling with those groups, variously leading or following in their wake, are many thousands of individual grassroots skeptics tethered by an ever-shifting maze of networking tools (from Skeptics in the Pub to Twitter).

How can this ragtag fleet accomplish anything? How can

existing skeptics' groups help it to do so? I think there are several answers to this.

First, skeptics must set aside the conceit that our goal is a cultural revolution or the dawning of a new Enlightenment. That concept resonates with me as powerfully as it does with anyone, but it is a dream with a bitter price: exhaustion and disappointment. After decades of labor, the horizon is just as far away as ever. When we focus on that distant, receding, and perhaps illusory goal, we fail to see the practical good we can do, the harm-reduction opportunities right in front of us. The long view subverts our understanding of the scale and hazard of paranormal beliefs,[1] leading to sentiments that the paranormal is "trivial" or "played out." By contrast, the immediate, local, human view—the view that asks "Will this help someone?"—sees obvious opportunities for every local group and grassroots skeptic to make a meaningful difference.

Second, we should recognize that the long-standing isolation-versus-unification conundrum is a false dichotomy. There are practically infinite opportunities for skeptical organizations to help each other toward our common goals, even as we diverge on areas of specialty or points of policy. Skeptics, like other groups, have their huffy schisms, but there is good news on this front, too: buoyed by grassroots enthusiasm and innovative independent projects, skeptical groups are more cooperative now than ever before. Old wounds are healing; new connections are being forged. There's something in the air: a hopefulness and sense of purpose that wasn't there even five years ago. (And I have to say that it feels wonderful.)

This brings us to the third point. It's not just that there are more grassroots skeptics. Here I must borrow a slogan from crowd-sourcing guru Clay Shirky: "More is different."[2] Yes, more supporters widen the net for the discovery of new activist leaders and breakthrough ideas, but the real untapped power of the new grassroots skepticism is its vast global distribution and its potential for collective action.

In the past, skeptical groups have been overwhelmed by the sheer number of paranormal industries and pseudoscientific claims. The few skeptics were all required to know something about everything, with the result that general remarks were often the best we could manage in response to specific claims. Now, suddenly, the community of skeptics is large enough for many independent skeptics to specialize to a wholly new degree and to engage thousands of regional or particular claims. This is a profound change. When skeptics in every town and nation are networked globally, our resolution increases by an order of magnitude. This trend is already visible in watchdog projects so specific that they can monitor single paranormal claimants (Robert Lancaster's Stopsylvia.com is a wonderful example) and blogs that focus on the skeptical challenges of a single industry (like skepticism in nursing) or avocation (consider Skepticdad.wordpress.com or Rationalmoms.com). This distributed, specialized, individual action should be assisted and celebrated.[3]

Different again is the power of thousands of grassroots skeptics to act collectively. This is the power of the "long tail of skepticism" concept promoted by SkeptiCamp[4] pioneer Reed Esau.[5] Not every skeptic can be an expert, even regarding

a small, local mystery. Few grassroots skeptics are qualified to be investigators or spokespeople and fewer still wish to be. But most skeptics are sufficiently interested to take some small action if barriers to participation are low enough. Taken collectively, thousands of tiny actions can have enormous effect. The classic example is Wikipedia. By making it push-button easy for millions of users to take occasional tiny actions, Wikipedia has become one of humanity's greatest resources. This is unquestionably one of the key tasks for skepticism in the coming years: discovering ways to harness that long tail.

To these ends—practical goals, cooperation, and grassroots activism—I recently had the honor of presiding over the production of *What Do I Do Next? Leading Skeptics Discuss 105 Practical Ways to Promote Science and Advance Skepticism.*[6] This free, sixty-eight-page ebook is formatted as a broad-ranging panel discussion in which thirteen experienced skeptics explore many possible avenues for grassroots skeptical activism. I submit that it is a useful model in two respects: it embodies generous collaboration and assistance across institutional boundaries, and it takes the new grassroots skepticism seriously.

This is unquestionably one of the key tasks for skepticism in the coming years: discovering ways to harness that long tail.

The *What Do I Do Next?* panelists represent a fair cross-section of skeptical thought (including leaders from several national skeptics' groups and five leading podcasts). It was inspiring to see so many groups and independents come together eagerly to openly share notes and promote grassroots activism. I take that as a wonderfully symbolic event—and as a road map.

More Professional

If independent amateur activism increasingly defines the road ahead, does this make traditional skeptical groups obsolete? Is their role merely to prop up amateur efforts? Are skeptical magazines, as some suggest, irrelevant?

No. I think the exact opposite is true. In my opinion, this is a watershed moment for traditional skeptical organizations, the moment when we start to really come into our own. As amateurs take up more of the burden of skeptical activism, organizations are increasingly free to focus on those things that only groups can accomplish. This is the paradox: the rise of the amateur skeptical movement makes professional skepticism a more important and more reachable goal than ever before.

Many tasks require dedicated organizations.[7] In this article, I'll concentrate on just one, a task that is among the most crucial: professional journalism. This is one undertaking in which traditional large skeptical organizations can and should remain the leaders of the skeptical movement—and in which they must dramatically improve if they are to remain relevant.

For decades, skeptical magazines have been rare sources for skeptical news items, opinion pieces, critical articles, and book reviews. Most of these pieces are unsolicited, unpaid, one-time submissions. They are rarely subject to detailed and expert fact-checking. Even with careful magazine editors, this process guarantees uneven quality, which is what we see: much good, some great, and some terrible.

More importantly, the reliance on unsolicited submissions severely limits editorial discretion and reaction time. When a paranormal story breaks or becomes visible on the horizon (as in the case of upcoming paranormal Hollywood movies) skeptical editors almost never have the ability to do the obvious: put a researcher or reporter on the story. This means the skeptical response is usually a dollar short and a day late, missing the news cycle and letting paranormalists frame the story.

I don't intend any reproach when I say that. I'm one of the staffers working hard to make skeptical magazines as good as they are, and I think our efforts have paid off very well. Modern skepticism is built on this model, but today the field of possibility has expanded.

Where the skeptical print literature was once a unique candle in the dark, independent skeptical blogs and podcasts can now deliver similar unpaid opinion content at a similar level of quality, often with better production values and much, much faster. But skeptical organizations can (sometimes) do something blogs can't: pay experts to pursue original investigative research.

Whether we think of Joe Nickell inside a haunted house, James Randi dialing into Peter Popoff's secret radio signals, Michael Shermer speaking in depth with Holocaust deniers, or even a contribution as modest as *Junior Skeptic*'s archival sleuthing, there is a special satisfaction in seeing someone dig into a mystery in a serious, sustained way. The active investigation model that made *Scooby-Doo* a beloved hit is also the proudest (and rarest) tradition of organized skepticism.

At the core of the skeptical literature is a promise: "If you read this, you will find out what's really true about weird claim X." Skeptical magazines can aspire to keep this promise, to accurately deliver the best available science and scholarship, only when they're able to identify mysteries, set experts to

work solving them, and set other experts to work fact-checking the answers. That editorial power requires writing and research staff, which requires money—which is why only a small minority of the content of skeptical magazines is written by professionals.

Can skeptical magazines move toward greater professionalism? Can they find ways to support high-caliber, full-time writers and researchers, fund sustained investigations, and market their findings with professional design, photography, and illustration?

Money is indeed an obstacle. (As *Skeptic* co-publisher Pat Linse often points out, "It's a miracle any of this happens at all.") This brings us back to our paradox and to the great opportunity and danger it represents. The rise of digital, grassroots skepticism makes some of the work of skeptical organizations obsolete, but it also represents a huge increase in potential support for our core investigative work.

It's no accident that the explosive grassroots growth centers on classic skepticism: podcasts debunking paranormal claims, Web sites fighting quack medicine, conferences examining pseudoscience, and so on. New skeptics are not bored by these core topics. For new skeptics (and for me) the fun of skepticism is in things that go bump in the night, and the ethical heart of skepticism is protecting the sick and the poor from callous exploitation by scam artists. The question new skeptics ask is not whether this work is worth doing but "Are skeptical organizations effective at doing it?"

If they believe organizations deserve attention and assistance, grassroots skeptics can offer two kinds of help: they can pursue independent skeptical activism in parallel to the work of skeptical organizations, or they can directly help those organizations by contributing money, buying magazine subscriptions, sharing Web links, and so on.[8] Skeptical organizations have a mandate to be as effective as possible, so it's responsible and practical for them to solicit this latter kind of direct help.

Can grassroots moral support be translated into the actual funds needed for better journalism? I submit that the answer is "yes"—if organizations send the right signal in a sustainable way. Skeptical organizations must demonstrate that they're clearly focused on the work that matters to grassroots skeptics: solving mysteries, catching bad guys, and helping people. They must show that they share the grassroots desire to creatively and passionately work together to move the ball down the field.

In my opinion, the first step is clear. If magazines want the resources to improve, they must first communicate a decision to improve. It's a catch-22, but the only way to send this signal is to act on it. Simple intention is more important than even money: skeptical magazines have not yet made it their explicit goal to evolve toward the reliability, investigative power, and production values of professional journalism. When this becomes the systematic goal—when skeptical organizations seize the forward momentum—the grassroots will respond.

Here at the crossroads, thousands of independent new skeptics stand ready to define the road ahead. If traditional skeptical organizations are to remain a central part of that definition, they must ask two questions: "How can we use our hard-won expertise to help grassroots skepticism reach its potential?" and "How must we change to deserve the help of the grassroots in return?" □

Notes

1. In an essay called "Where Do We Go From Here?" I offered the example of astrology. From a "culture war" perspective this is an utterly trivial issue, but, as the essay argued, "fully 25 percent of Americans say they 'believe in' astrology. For those keeping count, that's 75 million astrology believers in the U.S. alone. Can it really be that this number isn't vast enough to be worth our time?" Loxton, Daniel. "Where Do We go From Here?" 2007. www.skeptic.com/downloads/WhereDoWeGoFromHere.pdf.

2. Shirky, Clay. *Here Comes Everybody.* New York: Penguin Books. 2008.

For over 100 in-depth ways that grassroots skeptics can get more involved, visit:

www.skeptic.com/downloads/WhereDoWeGoFromHere.pdf

3. Established groups can assist independents in many ways, sharing promotion, resources, or expertise. The Skeptics Society, for example, invited the established independent podcast *Skepticality* to come under our banner as collaborative allies. The show hosts kept their autonomy while gaining our resources, and *Skeptic* gained a podcasting capability; both brands reenforced each other, and the overall goals of communicating skepticism were advanced in a non-zero-sum fashion.

4. SkeptiCamps (http://skepticamp.org/wiki/Main_Page) are small- to medium-scale, self-organizing grassroots skeptical conferences in which the audience members are also the presenters. The SkeptiCamp concept has taken off, with events taking place in the U.S., the U.K., Canada, and Austria.

5. Esau, Reed. "Raising Our Game: the Rational to Embrace SkeptiCamp." 2008. www.skeptic.com/downloads/raising-our-game-oct2008.pdf.

6. Loxton, Daniel, ed. *What Do I Do Next? Leading Skeptics Discuss 105 Practical Ways to Promote Science and Advance Skepticism.* 2009.www.skeptic.com/downloads/WhatDoIDoNext.pdf.

7. Examples include lobbying, providing a central contact point for media, maintaining libraries, and launching sustained research efforts.

8. For in-depth thoughts on 105 ways grassroots skeptics can either independently further skepticism or offer direct support for skeptical groups, see www.skeptic.com/downloads/WhereDoWeGoFromHere.pdf.

Daniel Loxton is a writer, illustrator, and skeptic. He is the editor of Junior Skeptic magazine, a kids' science section bound into the Skeptics Society's Skeptic magazine.

Reinventing the Skeptic Conference

REED ESAU

SkeptiCamps are informal, community-organized events borne of a desire to share and learn in an open environment. A SkeptiCamp event is not your typical skeptic conference; it represents a new way of thinking about how we distribute knowledge within our community. Rather than scheduling speakers from outside, we instead look within our local and regional communities of skeptics and ask each of them to put together a short talk on a topic that drives their passion for science and skepticism.

Our communities abound with depth of knowledge and diversity of experience. Our members include science and medical professionals, academics, teachers, and students, as well as people in occupations that aren't typically associated with skepticism but in which critical thinking is paramount, such as police detectives, librarians, attorneys, engineers, and financial advisors. Even skeptics who work as artists and athletes must contend with the fraud and superstition of their respective domains.

Critical thinking extends to hobbyist pursuits as well; a skeptical audio enthusiast, for example, should be knowledgeable of the snake oil of the industry. Anywhere the tools of critical thinking can be applied, knowledge among skeptics tends to accumulate.

However, that knowledge won't necessarily be shared with others. The enthusiast may not consider that her fellow skeptics would be interested in the topic. In addition, she may never have spoken before a group, at least outside of school or work, and may not be inclined to risk embarrassment or criticism.

Even if your local skeptics group is fortunate enough to have organizers who take the time to schedule talks, they may not be aware of the enthusiast's expertise, or if they are, they may be reluctant to schedule a talk whose topic lies outside the conventional subject matter of skepticism. As a result, much of that person's knowledge remains untapped.

SkeptiCamp is an attempt to unlatch that door by raising expectations of ourselves as skeptics and sharing our knowledge through open events where everyone is encouraged to do a short talk.

This unique and informal style of conferencing originated in the technology community with the first BarCamp event in Palo Alto, California, in August 2005. The event attracted over two hundred participants, most of whom either offered a presentation to their fellow attendees or helped organize the event. Local sponsors stepped in to provide the venue and free lunch and shirts for the participants. Since then, BarCamp has proven wildly successful, with events in over 350 cities around the world.

While BarCamp concerns technology, SkeptiCamp focuses

Image: Tim Farley

Organizer Taylor Proctor at Skepticamp 2008.

Reed Esau is a software architect in Denver, Colorado. Along with Rich Ludwig and Crystal Yates-White, he organized the first SkeptiCamp event in August 2007. For more information on SkeptiCamp, including details on past and upcoming events and tips on how to organize your own event, visit http://skepticamp.org.

on topics within science and skepticism. Of the nine SkeptiCamp events held since 2007, there have been more than eighty talks covering a wide range of topics, from the hilarious to the deadly serious. Topics on the lighter side have included theatrical superstitions as well as an inquiry into the New World Order conspiracies surrounding the Denver International Airport. Serious topics have included an academic presentation on the evolutionary basis of morality and a pediatrician presenting evidence of the effectiveness of vaccination in preventing infectious disease.

These are not formal lectures to a passive audience. SkeptiCamp is interactive by design, and speakers should expect questions during their talks. Those attending are asked to step beyond their traditional passive roles to actively participate and apply their critical thinking skills by asking probing questions. This not only makes for a more engaging experience but can also act as a quality control measure when the speaker is ill-prepared, making unfounded claims, or prone to poor reasoning.

SkeptiCamp places great value on improving our events by learning from our mistakes. Much has been learned from our early adopters in Atlanta, Columbus, Denver, Phoenix, and Vancouver, Canada. Capturing the lessons gained from those experiences in a persistent form, particularly in a wiki that can be collaboratively edited, can serve as a growing repository of "best practices" for great events and help avoid problems like organizer burnout.

On a deeper level, these open conferences face a key challenge that goes to the heart of our community. Put simply, if that audio enthusiast cannot be persuaded to offer a short talk to her fellow skeptics, then a culture of knowledge sharing may be beyond our grasp, and SkeptiCamp will struggle and ultimately fail.

However, if we can overcome that challenge, where will this experiment lead? We can look to BarCamp for an idea of what might be attainable, such as starting substantive events in places where none have been practical and opening conferences to those with language barriers or who otherwise cannot afford the time or cost to travel to remote events.

To get there, the open conference format proposes a simple bargain to skeptics. SkeptiCamp places substantive and fun events within our reach. It offers opportunities to participate in ways that leverage our enthusiasm and can meet the constraints of our busy lives.

In exchange, this bargain asks that you bring two things to the table. First, it asks you to talk about SkeptiCamp, to discuss what you have heard about past events and how hosting one might benefit your local group. Second, whether you are a new skeptic or an experienced hand, it asks you to support your local event, most typically by preparing a talk to share with your fellow skeptics or helping to organize the event.

SkeptiCamp's potential lies in its simplicity and the symbiotic benefits of sharing something you know (or have done) with your fellow skeptics. While challenges do exist, the open conference can change our expectations and enrich what it means to be a skeptic. □

A Skeptic's Guide to Podcasts

D.J. GROTHE

As most of the readers of the SKEPTICAL INQUIRER probably know, podcasts are audio shows that are made available as downloadable digital files, often through free subscription services such as Apple's iTunes. Over the last few years, the podcast has become an exciting medium for skeptics to reach out to new audiences while continuing to educate their existing members. Magazines, books, and television shows are no longer the only ways that people can get their regular fix of critical thinking and skeptical inquiry.

While there are so many great new podcasts promoting skepticism, here is a survey of some of the best and most popular. They vary in length and format: some are very short and feature just one person; others are long-format interview programs. While almost all are free, some require a paid subscription or a fee to listen to its archives. Some of the skeptical podcasts are humorous and involve a lot of banter, and some have specific themes, such as cryptozoology or conspiracy theories. The thing they all have in common is that they reach out to new people with a critical, rational, and scientific point of view toward pseudoscientific and paranormal claims.

The Conspiracy Skeptic

Started in late 2007, *The Conspiracy Skeptic* (www.yrad.com/cs/) is hosted by Canadian Karl Mamer, an expert in conspiracy theories. The show focuses on various conspiracy theories, such as those promulgated by Alex Jones about the New World Order, those on the Moon landing hoax, and HIV/AIDS denialists' theories that HIV/AIDS is a government plot. He also has had shows about The Illuminati, the Bilderberg Group, vaccine conspiracy theories, and many more. Most shows are about a half hour and feature Mamer speaking on various topics rather than featuring expert guests on a regular basis.

The Geologic Podcast

Hosted by musician and comedian George Hrab, *The Geologic Podcast* (www.geologicpodcast.com) features a monologue by Hrab, comedy sketches, and news about general developments in science and skepticism. Hrab doesn't apply his skepticism merely to the paranormal or the pseudoscientific; he often turns a skeptical eye on religion with his regular humorous feature "Religious Moron of the Week." This podcast is very funny, often containing adult humor. With episodes running about an hour in length on a weekly basis, this show is a favorite among skeptical podcast lovers.

D.J. Grothe is vice president and director of outreach programs for the Center for Inquiry, associate editor of Free Inquiry magazine, and a professional magician and "mindreader."

The Infidel Guy Show

Started by trailblazer Reginald Finley in 1999, *The Infidel Guy Show* (www.infidelguy.com) paved the way for Internet audio outreach about skepticism and related subjects. Most shows feature a listener call-in interview with an authority in a given field. While the majority of episodes focus on skepticism of religion and on atheism, many episodes have explored topics more central to the organized skeptical movement's interests: psychics, ghosts, cryptozoology, and the like. Although listening to recent episodes is free, one must become a gold member ($8.50 monthly or $75 annually) to hear most of the episodes from over the last decade.

Logically Critical

Logically Critical (www.logicallycritical.net) was "intended to encourage critical thinking in everyday situations without the hassle of checking facts at the library." The podcast ceased production in late 2007, but all previous shows are still archived online and available for free. The show often focused on one theme per episode and featured the host speaking on the topic at hand. Skeptically themed episodes included shows on ghosts, ancient monsters, the power of suggestion, the Law of Attraction, and the best-selling New Age book *The Secret* by Rhonda Byrne. Each episode is about a half hour and still worth a listen.

Point of Inquiry

As the host of *Point of Inquiry* (www.pointofinquiry.org), the weekly podcast of the Center for Inquiry (of which the Committee for Skeptical Inquiry is a vital part), I often assume the role of "devil's advocate" with my guests. The podcast was founded in late 2006, and almost two hundred episodes are available for free online as well as through iTunes and other podcatchers. While the program frequently focuses on topics in religion, ethics, philosophy, and public policy, it

also concentrates on traditionally skeptical topics such as Bigfoot, ghosts, UFOs and alien abduction, pseudoarchaeology, psychic investigation, and alternative medicine in addition to a number of shows on conjuring and its relationship to skepticism. Each episode features a long-form interview with a leading thinker in science, skepticism, or philosophy, and most of the biggest names in the skeptical movement have appeared on the show, including Michael Shermer, James Randi, Joe Nickell, Ray Hyman, and Kendrick Frazer, as well as a number of Nobel Prize-winning scientists and other leading public intellectuals.

Pseudo Scientists

The podcast of the Young Australian Skeptics, *Pseudo Scientists* (www.youngausskeptics.com), has a pronounced fun and youthful vibe. The show begins with an often humorous short audio clip of some purveyor of pseudoscientific nonsense followed by a shout of "That's Impossible!" It is hosted by Alastair Tait and features Jason Ball (a Center for Inquiry campus leader who recently spoke at CFI's World Congress), Jack Scanlan, Jacqui Williams, Elliot Birch, and others. The podcast airs a couple times a month; each episode is over an hour in length and includes interviews, book reviews, and other segments, including witty banter among the hosts about skepticism and irrational trends in Australia and around the world.

Quackcast

Quackcast's Web site (www.quackcast.com) declares it "A podcast review of Quacks, Frauds and Charlatans. Oops. That's not right. That should be Supplements, Complementary and Alternative Medicine i.e. SCAM." Generally running over an hour, each episode features a critical and skeptical exploration of alternative medicine topics, such as herbal remedies, chiropractic, homeopathy, traditional Chinese medicine, acupuncture, Reiki, therapeutic touch, the medical efficacy of prayer, and even questions like "can high doses of Vitamin C shorten the duration of the common cold?"

Reality Check Podcast

Considered a Canadian version of the *Skeptic's Guide to the Universe* (see below), *Reality Check Podcast* is produced by the Ottawa Skeptics and features skeptical banter from some of the group's members, including Jonathan Abrams and Xander Miller. The show focuses on various skeptical topics, such as the Moon landing hoax conspiracy theory, Bigfoot, various alternative medicine claims, pyramidology, and feng shui, and also features regular interviews of some of the leaders in the skeptical movement. *Reality Check*, like many of the other podcasts listed here, is a great example of what independent skeptical groups can accomplish even if they lack the resources of a national skeptical organization.

The Skeptic Zone

Sponsored by the organization Australia for Science and Reason, *The Skeptic Zone* (http://skepticzone.tv/) is hosted by Richard Saunders. Each episode generally runs over an hour with multiple segments. Saunders frequently interviews luminaries of the skeptical movement, such as Joe Nickell, and engages in news reports and panel discussions with co-hosts Rachael Dunlop, Joanne Benhamu, and Eran Segev, among others. *The Skeptic Zone* shows how the new medium of podcasting allows for worldwide skeptical outreach with minimal investment relative to print publishing.

Skepticality

The skeptical movement owes a lot to "Derek and Swoopy," hosts of the first skepticism podcast, which started in April 2005. *Skepticality* is now the official podcast of Michael Shermer's Skeptical Society. In September 2005, Steve Jobs, CEO of Apple Computer, mentioned *Skepticality* during his keynote address about the iTunes music store. On that same day, co-host Derek Colanduno suffered a brain aneurysm. As a result, no new shows were produced until August 2006, after he had recovered, and now episodes appear about twice a month. The shows average an hour and feature interviews with famous skeptics, such as James Randi, Ben Radford, and Joe Nickell, in addition to skeptical and science news and extemporaneous chitchat between the co-hosts.

The Skeptic's Guide to the Universe

One of the top skeptical podcasts on iTunes, *The Skeptic's Guide to the Universe* (www.theskepticsguide.org), is a one-hour weekly talk show produced by the New England Skeptical Society, in association with the James Randi Educational Foundation. It is hosted by Dr. Steven Novella, professor of neurology at Yale University, along with his two brothers, Bob and Jay Novella, Rebecca Watson (founder of skepchick.org), and Evan Bernstein. Each episode features many segments, including a guest interview and a segment called "Science or Fiction," in addition to a lot of light and witty conversation. The show covers a broad range of skeptical topics but generally avoids applying skepticism to religious faith claims except during some of the satire and jokes, which are a popular component of the banter among the co-hosts.

Skeptoid

Started in October 2006, *Skeptoid* (www.skeptoid.com) is a "weekly pro-science, anti-pseudoscience podcast" hosted by Brian Dunning. Episodes average about ten minutes in length, and each features Dunning expounding on a topic of interest to skeptics, such as pseudoscientific products and consumer frauds, urban legends, alternative medicine, and conspiracy theories. His short episodes are well-researched, and when taken collectively, very comprehensive. Dunning's podcast is a shining example of what one skeptical activist with a computer, a microphone, and an entrepreneurial spirit can accomplish for the skeptical movement.

Though hardly comprehensive, this list shows the array of skeptical audio that is available for your enjoyment on the Web and on your iPod or other MP3 player. Now more than ever, it is easier for you to share skepticism with those around you by turning them on to these podcasts. □

Skepticism via YouTube

TIM FARLEY

In the summer of 2008, Georgians Matthew Whitton and Rick Dyer claimed to have found a Bigfoot carcass. These claims were initially made via a number of YouTube videos that garnered significant attention in the cryptid community. In August 2008, they partnered with well-known cryptozoology personality Tom Biscardi for a national press conference. Almost immediately the carcass was revealed as a hoax involving a Halloween costume.

But a month earlier, rival Bigfoot enthusiasts and skeptics had carefully pored over one of Whitton and Dyer's promotional videos on YouTube ("Bigfoot Tracker Video 8") in which they met an alleged Texas scientist named Paul Van Buren who said he would authenticate the carcass (Bigfoot-police 2008). Sharp-eyed viewers quickly determined that "Van Buren" was actually Whitton's brother, a wedding photographer from Texas, and even found pictures online of the two together at one of their weddings (Coleman 2008).

The video was pulled off the Web and acknowledged by the hoaxers as a fake days later in another video. Whitton and Dyer said the video was an attempt to distract people who were harassing them. (They did not explain how a hoaxed video would accomplish such a thing.) This all happened weeks before the national press conference. Those who followed the whole fiasco from the beginning via YouTube were not surprised when the hoax was finally revealed nationally weeks later.

YouTube might seem an unlikely venue for skeptical investigations. The online video site originated as a way for individuals to easily share videos online without having to deal with technical issues like file formats and software compatibility. YouTube gained fame through a series of "viral" videos of various ephemera such as laughing babies, stunts gone wrong, adorable kittens, and so on. It hardly seemed a good venue for skepticism in those early days.

Tim Farley is a software engineer and technical instructor in Atlanta, Georgia. He is the creator of the Web site What's The Harm (http://whatstheharm.net), which explores why believing in pseudoscience and the paranormal is harmful. He blogs at http://skeptools.com and can be emailed at admin@whatstheharm.net.

But like most new tools, uses far beyond those initially anticipated were soon discovered. The availability of low-cost video cameras and editing software means that video production is now something that many hobbyists can attempt at home. Purchased by Google in 2006, YouTube is now home to hundreds of millions of videos and serves over a hundred million individual video views per day. Google claims that over thirteen hours of new content is uploaded on YouTube every minute (Google 2008).

Many skeptical organizations now use YouTube to distribute video content to the public. Videos of the James Randi Educational Foundation's July 2009 test of dowser Connie Sonne for their Million Dollar Challenge, among other videos, can be found on JREF's own channel (JREF 2008). The SKEPTICAL INQUIRER's parent organization, the Center for Inquiry, also has its own YouTube channel (see figure 1) with hundreds of lectures, debates, and other videos. It is often rated in the top ten most viewed nonprofit channels on the

Figure 1: The Center for Inquiry's YouTube Channel

site (Center for Inquiry 2006). These are fantastic educational resources for both skeptics and the general public.

The site has always been friendly toward individuals as well as organizations, and individual skeptics have fittingly stepped forward to create content. Richard Wiseman used YouTube videos to promote and support his book *Quirkology* by demonstrating optical illusions and other psychological effects (Wiseman 2009). His video "Amazing Colour Changing Card Trick" has been viewed over three million times and has even been redone by several other YouTube users (Wiseman 2007; see related story). Phil "The Bad Astronomer" Plait

has a channel as well, where he posts his own special mix of skepticism and astronomy (Plait 2009).

Some of the most interesting aspects of skepticism on YouTube do not come from organizations or professional skeptics but are occurring at the grassroots level between individual users. Simple, short videos debunking paranormal or pseudoscientific concepts, when created with cleverness and good visuals, can be very effective. One example, "Bigfoot Myths: Where are the Bones?" addresses the simple question: Why have we never found Bigfoot bones? (Doctor Atlantis 2007). Resources like this can easily be hyperlinked from discussions of the topic online or even embedded directly into posts on other Web sites. They help to explain key scientific concepts using visuals instead of words alone (in this case, photos of actual bear bones and interview footage with a cryptozoologist).

Aside from the general availability of the service and the fact that it is free, there are two other key elements that help maintain the grassroots skepticism phenomenon on YouTube: the fair use clause in U.S. copyright law and the explorative nature of the YouTube user interface.

Fair use is vital to the very existence of YouTube. The law holds that it is legal to reuse small portions of copyrighted material, even without the owner's permission, for comment, criticism, or parody (Stanford 2007). This allows skeptics to freely post online videos that include portions of the pseudoscientific or religious videos they are debunking.

Some of the most interesting aspects of skepticism on YouTube do not come from organizations or professional skeptics but are occurring at the grassroots level between individual users.

The Uri Geller videos posted by YouTube user The Friendly Skeptic are a good example. By implicitly invoking fair use, The Friendly Skeptic can post small broadcast clips from programs in which Geller's conjuring and trickery is plainly visible. In one he shows quite clearly where Geller puts on a false thumb tip just prior to making a magnetic compass move ostensibly by paranormal means (The Friendly Skeptic 2007). When, in another video from an older talk show, Geller bends a spoon using a decidedly nonpsychic technique (i.e., his hand), the exact moment is highlighted (The Friendly Skeptic 2008).

Another creative use of this method is employed by putative superhero Captain Disillusion (portrayed by actor and filmmaker Alan Melikdjanian; see figure 2). As Captain Disillusion, Melikdjanian humorously deconstructs the very viral videos that make YouTube so successful by explaining the digital editing techniques used in their creation (Captain Disillusion 2007). Many of these are simply viral advertising but others cover skeptical topics. Captain Disillusion debunked the November 2007 "Blue Ghost" incident at a Parma, Ohio, gas station, re-editing the news coverage to clearly show the actual cause: a bug on the camera lens (Captain Disillusion 2008). There were other, more scientific YouTube debunks of this incident as well; an excellent example included hypotheses, predictions, and conclusions (Answers in Skepticism 2007).

The skeptical movement online has flourished in part because of YouTube's site design. It is in Google's own interest to keep users on the site as long as possible since their revenue comes from advertising. The site is designed to encourage exploration with features that link videos together via "responses," add hyperlinks between videos, and mark a video with a world location so it can be found within mapping services (see figure 3). These features allow skeptics to make their content more discoverable from within the site and elsewhere. Debunking videos, for instance, can be posted as responses that are directly linked to (and therefore discoverable from) the original pseudoscientific content. This technique has been used in responses to the Georgia Bigfoot hoaxers, in Captain Disillusion's videos, and elsewhere.

Figure 2: Captain Disillusion

This explorability of YouTube helps address a key question often asked among online skeptics: Where should we focus our efforts? Many skeptics post almost exclusively on skeptic-run Web sites, forums, or blogs. The obvious disadvantage is that one often ends up "preaching to the choir." The alternative—posting on Web sites run by believers in pseudoscience or paranormal—has its own hazards. Often these sites are not interested in debate and will delete skeptical posts or even ban skeptics from posting entirely.

By posting material on YouTube and making the content as discoverable as possible, skeptics avoid both issues. The content can still be embedded or hyperlinked from skeptic sites as desired, but it can also be found by many more people via the YouTube site directly. This helps get the skeptical message out to those who most need it.

One of the most visible uses of the YouTube discoverability and response format are the creationism-related videos posted by users VenomFangX and ThunderF00t (VenomFangX 2006; Thunderf00t 2006). VenomFangX is the online handle of Shawn, a Christian teenager who posted a series of videos in which he claims to debunk evolution. YouTube user Thunderf00t (an adult academic) responds to each of the teen's videos and answers them point by point in the series "Why do people laugh at creationists?" The entire exchange lasted for almost two years. Thunderf00t also addressed the claims of other evolution deniers in the series, such as Casey Luskin of the Discovery Institute and evangelist Ray Comfort. Each video (over thirty in all) received at least 100,000 views, and some have been seen nearly half a million times (Thunderf00t 2009).

The Thunderf00t versus VenomFangX exchange also highlights one of the current pitfalls of U.S. Copyright law: the application of the Digital Millennium Copyright Act (DMCA) Takedown Notices. This is a clause in the DMCA under which copyright owners who believe their work is being infringed upon (beyond fair use) via the Internet can merely notify

Google Earth

Figure 3: Example of a skeptical YouTube video being discovered via a mapping application

the carrier to remove the material. On December 9, 2008, someone claiming to be a third party acting on behalf of VenomFangX contacted YouTube claiming that Thunderf00t's videos violated copyright. Two videos were restricted as a result. Thunderf00t issued a counterclaim, and a very public war of words ensued between the two parties (Thunderf00t 2008). The issue was resolved when VenomFangX's parents became aware of his activities. He withdrew the DMCA claims, apologized, and temporarily stopped posting.

False DMCA claims and other digital shenanigans continue to be a problem for skeptics on YouTube. According to Thunderf00t, creationists hurt his videos' rankings in the YouTube rating system by using automated scripts to send thousands of negative votes to each of his videos. The comments system provided by YouTube is also somewhat hit or miss. Occasionally some videos will attract reasonable commentators, but most of the time the comments aren't much better than digital graffiti. (The problem is so rampant on YouTube that a number of third-party software tools have been designed solely to "clean out" undesirable comments from YouTube pages.)

Overall, however, YouTube is an excellent avenue for skeptical outreach on the Internet. Its ease of use and lack of fees lower the barrier of entry so almost any skeptic can participate. Fair use ensures a steady stream of source material to debunk. The high traffic of the site and its explorability make the skeptical message accessible to people who may not even be aware of organized skepticism. Any skeptic with minimal audiovisual editing skills should consider YouTube an outlet for their efforts. □

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Skepticism: New Paths Ahead

JEFF WAGG

I just returned from Dragon*Con, the "convention of conventions" that is held over Labor Day weekend each year in Atlanta. The convention recently added Skeptrack, a set of lectures and events designed to introduce and promote scientific skepticism.

This was my third year speaking at Dragon*Con, and I was gratified to see so many familiar people—D.J. Grothe, Ben Radford, and Joe Nickell from the Center for Inquiry; Phil Plait from the James Randi Educational Foundation; and Daniel Loxton from the Skeptics Society to name just a few. It was a wonderful and rare experience to rub elbows with representatives of the three largest skeptical groups in the United States.

But Dragon*Con is not a skeptics' convention. It's something bigger.

Since its inception over a decade ago, Dragon*Con has primarily focused on the science-fiction community, especially television and film series such as *Star Wars*, *Star Trek*, *The X-Files*, and *Doctor Who*. The more than 40,000 attendees (many of whom attend in elaborate costumes) are extremely diverse, with interests ranging from Chinese and British culture to Goth music and robot battles. Not surprisingly, attendees have expressed interest in science, and talks about space exploration and genetic engineering have become commonplace. As one might expect, some of these talks are devoted to skeptical topics and feature speakers such as Ben Radford, Michael Shermer, and me. They've proved to be very popular, and Derek Colanduno of the *Skepticality* podcast suggested that there might be enough interest for a separate track dedicated to skepticism. He was right, and Skeptrack was born.

Skeptrack was launched in 2008, and interest has continued to grow. Many of this year's skeptical talks were standing room only. In fact, Skeptrack threatens to outgrow the origi-

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nal Science Track that spawned it.

There is much overlap in topics between the two tracks—as the difference between science and skepticism is a matter of approach rather than content—but there is strong demand for purely skeptical lectures. Interest in the paranormal and unexplained remains high among the public, and the parade of hit reality-TV shows featuring miracles, ghosts, Bigfoot, and psychic powers only whet its appetite. The skeptical community is uniquely qualified and prepared to rebut such claims.

Rancor and disagreements among skeptics have occurred in the past, but I believe a new generation of skepticism—this Skepticism 2.0—can flourish.

At one panel, I asked the audience members how many of them were at their first skeptical event. Half of the room—easily hundreds—raised their hands. Then it dawned on me: something was happening that had never happened before. The barrier to skepticism had been lowered significantly with the advent of Skeptrack at Dragon*Con.

There are numerous skeptics' conferences in the U.S. each year where attendance is also growing. I had the pleasure of attending CFI's 2009 World Congress and the Amaz!ng Meeting this year, and the crowds were fired up. Nothing can compare to being in a room with 1,000 like-minded folks, especially when you remember that you once felt alone.

But while these events are not to be missed, they consist of people who have already identified themselves as skeptics. Many of the those attending Dragon*Con have never even heard of skepticism. Journalists and ordinary folks alike expressed relief, excitement, and interest in this newfound skeptical community. Some may have a vague idea of who James Randi, Paul Kurtz, and Michael Shermer are, but the idea that there is a movement afoot never crossed their minds.

For example, if a Dragon*Con fan is interested in haunted houses as well as *Star Wars*, he might look at the schedule for all the ghost-related events and come across a Ben Radford lecture on poltergeists. Intrigued, he will attend and might hear the rational side of ghost hunting for the first time. He may leave the lecture still believing in ghosts, but he'll have new information that might cause him to doubt what's actually happening the next time he watches *Ghost Hunters*.

Of course, bringing together disparate views in the same location can lead to interesting situations. In past years, a hugely attended "Skeptics vs. Believers Smackdown" featured a panel of well-known skeptics debating similarly well-known believers. While the debate is at times spirited, both sides have the chance to interact in a neutral environment that doesn't exist at either skeptics' conventions or paranormalist gatherings. These debates demonstrated that the appellation "skeptic" is sought by both skeptics and believers, as everyone on the panel said they were skeptical of most claims of the paranormal. While that is debatable, it's important to see that even those we may think are lost to unfounded belief value critical thinking. Perhaps all they need is some education.

Sadly, the "Smackdown" has been discontinued due to lack of available speakers on the believers' side. It seems they're not interested in debating their belief in the paranormal, which is very telling. While it's easy for skeptics to claim victory in this case, we need to realize that interaction with those on the other side is important. We have the rare opportunity to agree that the concept of ghosts is a fun one while proving that skepticism can be fun too.

While Dragon*Con will never replace our traditional annual gatherings, it should be an important part of the skeptical convention circuit because it allows us to talk directly to those we might not reach otherwise. The all-accepting atmosphere gives both sides an opportunity to share their views with confidence that they won't feel singled out. And who knows, maybe we'll find out that we're not as different as we think. New information should breed new opinions, and we have plenty to share.

Dragon*Con also illustrates that members of the three major U.S. skeptics organizations can work shoulder to shoulder promoting skepticism. While each organization has its own unique mission and talent pool, we share a common cause. It is no secret that rancor and disagreements have grown among some of the personalities in the past, but I believe a new generation of skepticism—this Skepticism 2.0—can flourish. Given that James Randi spoke recently at the 2009 CFI World Congress and Joe Nickell and D.J. Grothe spoke at the Amaz!ng Meeting 7, I think we can safely say that past disagreements have been put aside and new alliances are in the making. Each of the organizations has its strengths, and if they can share those strengths with each other in a way that diminishes none and promotes all, the future of skepticism is strong indeed. In fact, it seems inevitable.

Perhaps in the months and years ahead we might hold joint conferences or a Leaders in Skepticism Seminar. With encouragement and a renewed spirit of cooperation, perhaps Sagan's candle in the dark will become a bright flame, a beacon for science and skepticism worldwide. □

Surfing for Skeptics

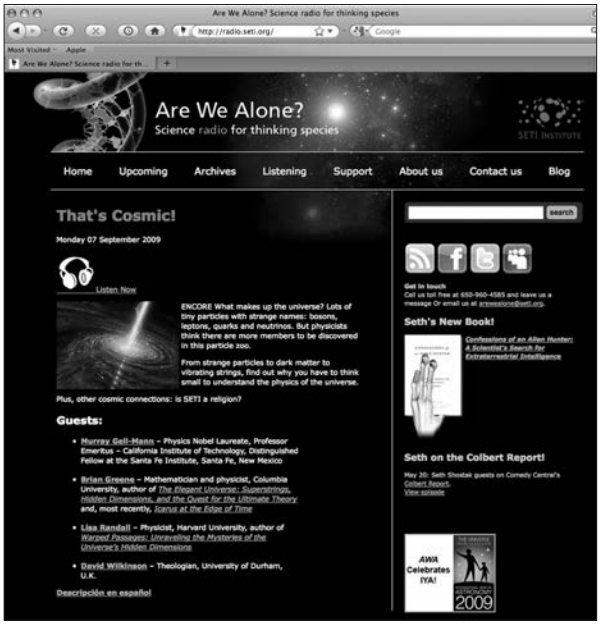
A Survey of Skeptical Web Sites

BLAKE SMITH

Whether you are looking for data on a particular type of questionable claim, trying to find some like-minded friends in your area, or just want to listen to some other skeptics talk about what they're doing to promote reason, there are many Web tools out there to help. The emergence of social-networking sites, podcasts, blogs, and other Web 2.0 tool sets have helped create an Internet community of skeptics, rationalists, and free-thinkers. Just doing a Google search on "skeptic" may not get you exactly what you're looking for, so we've compiled a list of skeptically themed Web sites to help you tap into the online world of critical thinkers. On these sites you will find blogs, discussion forums, news articles, magazines, videos, chat, podcasts, editorials, and a large, vibrant community of people interested in making the world a more reasonable place.

Are We Alone? (http://radio.seti.org)

The Search for Extraterrestrial Intelligence (SETI) has its own share of skeptics out there, but the *Are We Alone?* podcast is a great popularizer of science and reason. Once a month, the podcast has an episode devoted to skepticism and features regular guests like Phil Plait (Bad Astronomy, JREF) and Jim Underdown (CFI/Los Angeles). Hosted by Seth Shostak and Molly Bentley, each episode examines a single theme and interviews scientists and experts who can shed light on the challenging ideas presented that week. The show's serious content is interspersed with light comedy through amusing vignettes and Seth's occasional puns.



Australian Skeptics (www.skeptics.com.au)

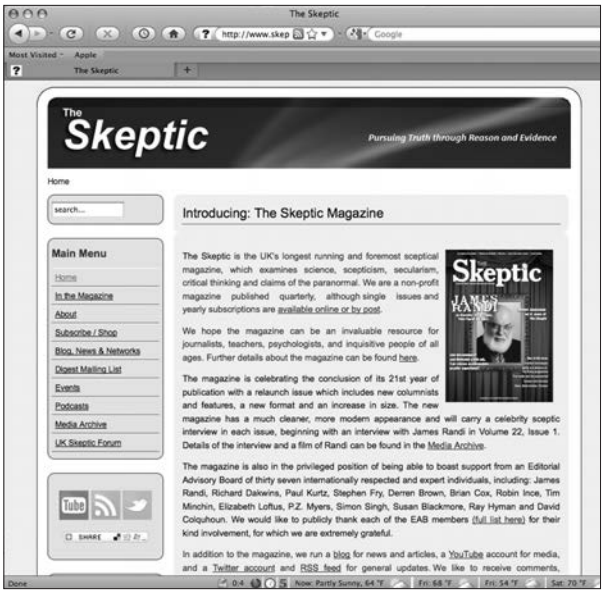
The Web site of the Australian Skeptics hosts a collection of scholarly articles, essays, educational resources, *The Skeptic* magazine, and *The Tank Podcast*. The Australian Skeptics are a collection of affiliated skeptical groups and individuals from Down Under. Their presence is felt globally through their Web page and the activism of members such as Richard Saunders, who has made numerous television appearances as a skeptical authority. The group's efforts to promote vaccinations and combat anti-vaccine hysteria have been particularly noteworthy.

Bad Astronomy (http://blogs.discovermagazine.com/badastronomy/)

Phil Plait is an author, astronomer, blogger, and president of the James Randi Educational Foundation (JREF). Starting with a simple explanation of the egg equinox myth (look it up if you don't know it), he has carefully nursed a series of articles about astronomy mistakes in movies and his debunking of the Moon hoax conspiracy into a full blown career. His Bad Astronomy blog is now a part of *Discover* magazine, and from that digital pulpit he preaches the value of skepticism, the wonders of science, and the beauty of the cosmos. He also uses his influence to help spread skeptical activism to thousands of readers through links and commentary. The site also has information on his newest book, *Death from the Skies!*

Bad Science (www.badscience.net)

Ben Goldacre is well known for taking science journalists to task for misreporting information in the media. Through his weekly column in *The Guardian,* he critically examines science journalism, alternative medicine, and the behaviors and practices of the pharmaceutical and medical industries. Some of his articles have been collected and expanded in the book *Bad Science*, and his Web site and column have been influential in covering the plight of author Simon Singh as he battles the British Chiropractic Association. Goldacre's investigations have also targeted duplicitous advertising practices in the therapeutic remedies market.



The U.K. Skeptics (www.skeptic.org.uk)

This is the Web site for the U.K. Skeptics and *The Skeptic*. The site also hosts a podcast, *Little Atoms*, and a blog. There are links on the site to RSS feeds (syndication tools) for keeping up with all the latest in U.K. skepticism, including the Skeptics in the Pub lecture series and upcoming skeptical conferences.

Committee for Skeptical Inquiry (www.csicop.org)

The Committee for Skeptical Inquiry's Web site URL is reminiscent of the organization that produces SKEPTICAL INQUIRER's storied history (it was formerly the Committee for the Scientific Investigation of Claims of the Paranormal, CSICOP). A variety of articles from previous issues are available at the CSI Web site. The site also has exclusive content, such as articles and columns, and links to other CSI-related sites such as The Skeptiseum (which features many items from investigator Joe Nickell's collection). The site's searchable article archive is a powerful tool for the skeptical researcher.

QuackWatch (www.quackwatch.com)

The QuackWatch organization has been in existence since 1969, with a Web presence since 1996. Their Web site (through the main site or one of its many subsidiaries) provides details on a variety of medical and business scams and exposes quackery in areas such as homeopathy, autism, dieting, and multi-level marketing. The years of research they have conducted and collected make this a robust resource for medical information.

Quirks and Quarks (www.cbc.ca/quirks/)

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"THE SCIENCE SHOW THAT DEFIES GRAVITY."
radio one
Join host Bob McDonald each week to find out the latest in science, technology, medicine and the environment.
We cover every aspect of science, from the quirks of the expanding universe to the quarks within a single atom...and everything in between.
Quirks & Quarks is heard on Saturdays on CBC Radio One from 12:06 - 1:00pm in Canada, with a rebroadcast Monday evenings at 11:06pm, and also on Sirius satellite radio. You can also listen to the MP3 audio files here on our web page or subscribe to our podcast.
September 12 - This Week on Quirks & Quarks:
Oceans of Trouble. We kick off our 35th season with a full-edition special on the state of the world's oceans. Our seas are in trouble -- serious trouble -- and marine scientists have only begun to understand just how imperiled they are. From over-fishing to ocean acidification, there's a growing threat to the health of our oceans, which could threaten life on land as
Quirks & Quarks Blog
cbc.ca/podcasting

The Canadian Broadcasting Corporation's weekly science show discusses science news items with the authors and scientists behind the work. Host Bob MacDonald asks questions that provide the layman listener a better understanding of what are often nuanced discoveries or insights into how the world works. There is also a recurring feature that asks an expert about the veracity of commonly held "folk wisdom" to see if it is true or false. The show is available as an hour-long block or broken down by article segments.

Science Blogs (www.scienceblogs.com)

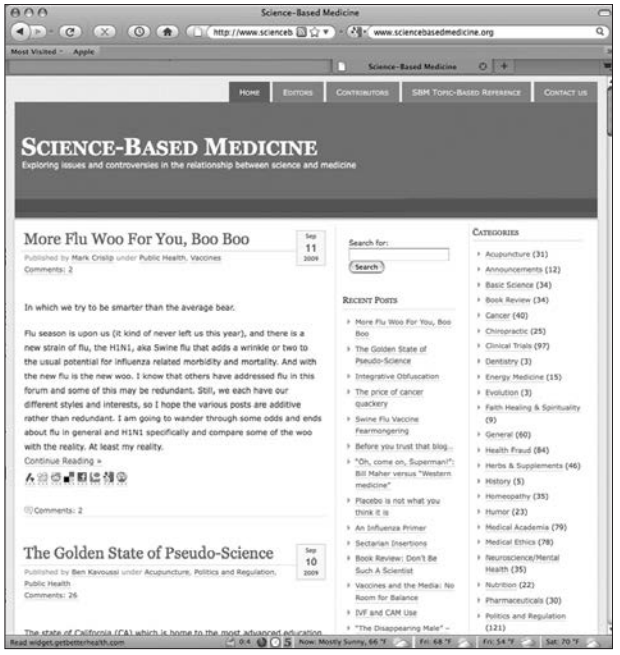
Science Blogs is an umbrella site that gathers more than seventy writers, covering areas of life, physical, environmental and brain science as well as science news, science education, and technology. This is the home of the P.Z. Meyers's Pharyngula blog, one of the top-ranked science blogs on the Internet, as well as The Panda's Thumb. While you may not be interested in every kind of science covered, if you're a science enthusiast, there is likely to be something here you will enjoy.

Science Talk (www.scientificamerican.com/podcast/)

Science Talk is the podcast of the journal *Scientific American.*

Host Steve Mirsky is also the author of *Sci-Am*'s "Antigravity" column, which deals with a variety of nonsense with a sensible, though often wry, approach. Likewise, the podcast deals with many serious science topics, but Mirsky brings a light tone to the program, demonstrating that science need not be dull.

Science-Based Medicine (www.sciencebasedmedicine.org)


Science-Based Medicine
SCIENCE-BASED MEDICINE
Exploring issues and controversies in the relationship between science and medicine
More Flu Woo For You, Boo Boo
The Golden State of Pseudo-Science

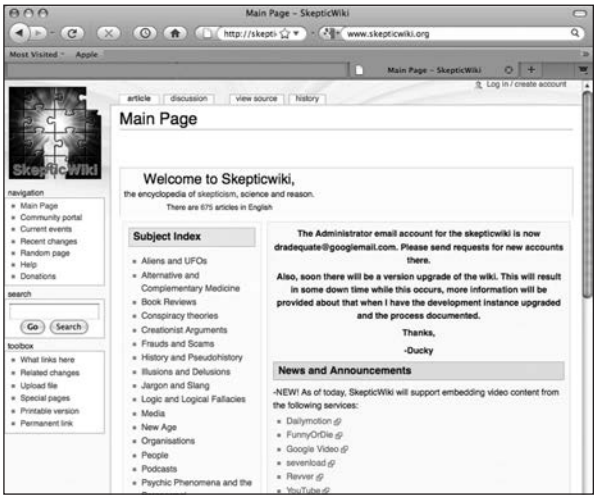
Keeping up with news and breakthroughs in medicine can be difficult, especially when determining what is a real, efficacious treatment and what is marketing or metaphysical hooey. The Science-Based Medicine blog examines the latest in medical news and controversy through the eyes of its contributing authors. The authors are prolific, and many of them will be familiar to SKEPTICAL INQUIRER readers: Dr. Harriet Hall, Dr. Steven Novella, Dr. Mark Crislip, and other regular contributors provide articles that range from brief to expansive as they expose deception and laud advances within medicine.

SciencePodcasters.org (www.sciencepodcasters.org)

Science Podcasters is a loose affiliation of science-themed podcasts gathered under a single umbrella. Created by Dr. Ginger Campbell, the site is host to more than a dozen podcasts that deal with hard science and medicinal issues. Dr. Campbell's own show, The Brain Science Podcast, is notable for its in-depth coverage of brain issues as well as science news and the dangers of alternative-medicine therapies.

Skeptic (www.skeptic.com)

The Web site companion to *Skeptic* magazine, this site is home to The Skeptics Society, Michael Shermer's nonprofit skeptical outreach organization. With online features like eSkeptic and The Skeptics Mix Tape, the site provides many free videos and resources to educate and assist skeptics in combating huge swaths of the paranormal, antiscience, and bunk. Also available on the site is Daniel Loxton's "What Do I Do Next?" essay, a fantastic guide for enthusiastic skeptics to channel their energy into activism through a variety of projects and suggestions (see Loxton's piece in this issue).



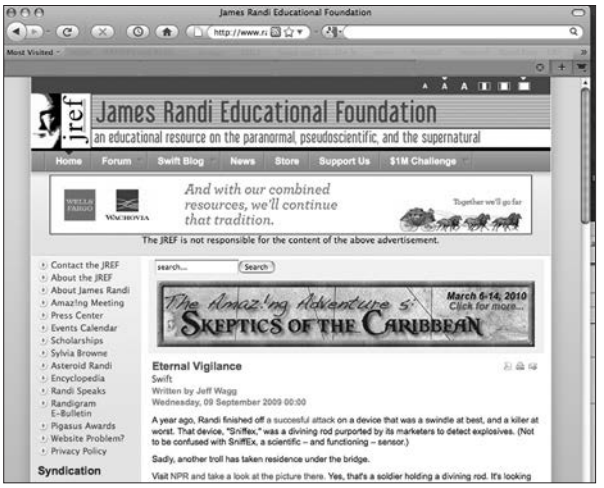
Skepticwiki (www.skepticwiki.org)

A wiki is a Web page that is written by an entire community of users rather than a centralized author. The most famous of these is Wikipedia, the online encyclopedia. Skepticwiki utilizes the same technology to focus on topics pertinent to skeptics and (in theory) free from the influence of nonsense peddlers. It can be a helpful site for researching skeptical topics, and if you see anything missing, you can help out by adding your own articles and references. It is worth noting that Wikipedia also needs skeptical writers to keep fraud and pseudoscience out of the world's largest online encyclopedic reference source.

Snopes (www.snopes.com)

This is quite simply one of the best tools on the Internet for determining if the e-mail your friend, relative, or co-worker forwarded you about some unbelievable claim is true. The site, the work of folklorists Barbara and David Mikkelson (and other occasional contributors, such as Ben Radford), collects urban legends and checks their veracity. Each entry has a simple format that quickly helps you determine whether the item is true, false, or undetermined. If you enjoy reading about urban legends,

the site can be a source for hours of entertainment. The site's reputation has become so widely known that new urban legends seeking propagation often start with "This is true—checked it on Snopes." It seems that ignorance is aided by laziness, for nearly any well-disseminated e-mail myth can be quickly confirmed or debunked at Snopes—yet note the Snopes database itself shows that such messages find cyclical renewal on the Internet.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Eternal Vigilance
Swift
Written by Jeff Wagg
Wednesday, 09 September 2009 00:00
A year ago, Randi finished off a succesful attack on a device that was a swindle at best, and a killer at worst. That device, "Sniffex," was a divining rod purported by its marketers to detect explosives. (Not to be confused with SniffEx, a scientific – and functioning – sensor.)
Sadly, another troll has taken residence under the bridge.
Visit NPR and take a look at the picture there. Yes, that's a soldier holding a divining rod. It's looking

The James Randi Educational Foundation (www.randi.org)

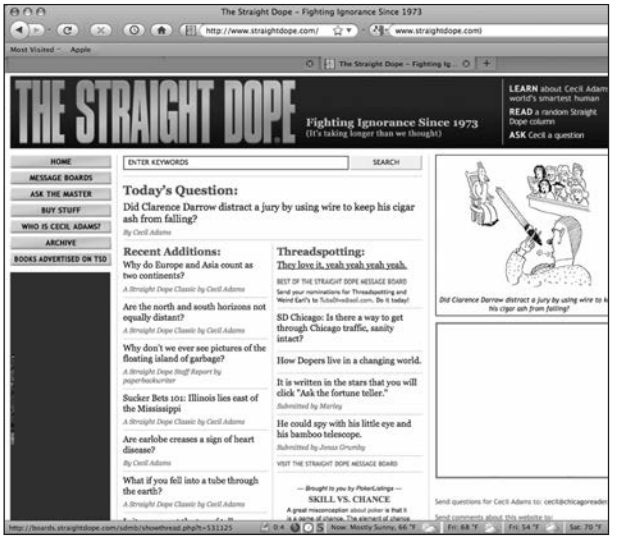
The JREF is the Web site of the elder statesman of skeptical inquiry, James Randi. Through his newsletter (now a blog), Randi and JREF members Jeff Wagg and Phil Plait comment on the latest in hoaxes, quackery, scams, and flim-flam. The site contains a large library of Randi's videos, articles, news on the latest conferences (The Amaz!ng Meetings), and other skeptical outreach. There is a vast Web forum on the site, but be warned that it brings out believers and skeptics; when they meet, there is often heated discussion—not all of it civil.

The Museum of Hoaxes (www.museumofhoaxes.com)

The Museum of Hoaxes is a reference site for information on hoaxes as well as a book and blog discussing what seem to be dubious claims or hoaxes in the current news stream. In-depth articles by researcher Alex Boese about such classic hoaxes as Piltdown-man, the Cardiff Giant, and even Mary Toft and her curious ability are included in the site's "Hoaxipedia." It is a source of interesting reading if you'd like a sampling of what people will fall for.

The Skeptic's Dictionary (www.skepdic.com)

Author Robert Todd Carroll's Web site hosts hundreds of articles on a variety of skeptical topics. It is a useful reference for a quick overview of paranormal, pseudoscientific, alternative-medicine, and otherwise remarkable claims. Carroll collected more than 400 of his entries into a book version, but the Web provides the most current information on these topics. If you have heard a new claim or are unsure why skeptics are so doubtful of an old one, this should be one of your first stops when researching the subject.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Why don't we ever see pictures of the floating island of garbage?
Sucker Bets 101: Illinois lies east of the Mississippi
Are earlobe creases a sign of heart disease?
What if you fell into a tube through the earth?
Threadspotting:
They love it, yeah yeah yeah yeah.
SD Chicago: Is there a way to get through Chicago traffic, sanity intact?
How Dopers live in a changing world.
It is written in the stars that you will click "Ask the fortune teller."
He could spy with his little eye and his bamboo telescope.
SKILL VS. CHANCE

The Straight Dope (www.straightdope.com)

Cecil Adams, the nom-de-sceptique of the research staff at the *Chicago Reader* newspaper, answers a variety of questions ranging from the obscure to the erotic to the erratic. His column, "The Straight Dope," has been syndicated in more than thirty newspapers and collected in five books, but the Web site's search engine allows you to find answers much more quickly. Follow-ups and updates related to particular questions are appended to each article, so you can be sure that the article you are reading has all the facts you need.

What's the Harm? (www.whatstheharm.net)

Skeptical activist Tim Farley wanted to do something to help promote critical thinking. His idea was to help answer that age-old question, "What's the harm in _____?" And whether you fill in that blank with homeopathy, psychics, ghosts, or chiropractic, Farley has compiled articles and references that help put a dollar amount or a number of persons injured or killed onto the scale with which we measure the cost of harm. As of this writing, Farley has "collected the stories of [more than] 670,000 people who have been injured or killed as a result of someone not thinking critically." □

Blake Smith is a skeptical researcher, Web programmer, and co-host of the MonsterTalk podcast (www.monstertalk.org).

Skepticism and Blogging

KAREN STOLLZNOW

Blogs first appeared in the late 1990s as "web logs," in the form of journals or diaries. *Blog* has since become a generic name for a self-published Web site that features short, usually informal articles, commentary, knowledge-sharing, and opinion pieces. Blogs are often personalized, public, updated regularly, and thematic, though they can cover diverse issues, fields, and genres, varying widely in purpose and scope.

The past decade has brought a boom in blogging. Today, there are over 110 million blogs. With thousands of blogs about science, technology, and related fields and over 1,000 about critical thinking, blogging has become a prolific medium for skepticism.

Blogging has many advantages for both skeptical writers and readers—it is a simple way to become involved in skepticism. All you need is a program and a point of view. For those daunted by technology, blogging doesn't require a degree in computer programming. Whether you're a novice to the net, a dabbler in HTML coding, or an expert in JavaScript, publishing platforms are easy to use. Self-publishing programs such as WordPress, Blogger, and LiveJournal allow users to work in a visual mode that isn't any more complex than using word-processing software. Blogs are often free to set up and maintain and, most important, free to read.

Blogs are a sociable way to become involved in skepticism. They are integrative and interactive. Readers can participate in the blog by commenting publicly on the author's posts and reading other's remarks, thereby creating a virtual community. Blogs are mainly textual, but the author can upload images, embed music and videos, add links to relevant sites, and provide direct references.

Blogging is skepticism without borders, allowing for the rapid dissemination of information and immediate reach of readers on a global scale. They are particularly practical as news bulletins for current events in skepticism and can also function as a resource and repository, with older articles retained in an archive. A search function and category system allows readers to locate posts on specific topics.

Blogs are a useful method to promote both skepticism and the blogger. Many bloggers create sites to complement their books, podcasts, television shows, and other products. Bloggers also provide links to publicize other sites, known as blogrolls. Some simply advertise other blogs, such as the Atheist Blogroll (http://atheistblogroll.blogspot.com/), which maintains a register of sites about atheism, freethinking, humanism, and skepticism. When used in conjunction with networking pages like Facebook and Twitter, content-sharing sites such as Digg, and blog-specific search engines like Technorati, blogging becomes a perpetual motion machine of skepticism in action.

However, blogging isn't for everyone. Blogs are free to write and read, but they require free time. Few writers make a career out of their hobby to become professional bloggers, and even fewer probably deserve to make a living out of blogging. Many blogs are of poor quality; they are informal, unedited, and certainly not peer-reviewed. Just like with Wikipedia and other online knowledge sources, skeptics need to be skeptical of the reliability of information provided on blogs. Fortunately, readers filter blogs. In a cybernatural selection, good blogs often become popular, bad blogs are unread, and

ugly blogs eventually become defunct.

The majority of skeptical blogs are written by individuals passionately interested in skepticism, and some are even penned by prominent skeptics themselves. Richard Wiseman's (http://richardwiseman.wordpress.com/) features quirky science, updates about his experiments, and his collection of optical illusions. Ben Goldacre's Bad Science (www.badscience.net/) is an accompaniment to his book and *Guardian* newspaper column of the same name. Steven Novella's Neurological (www.theness.com/neurologicablog/) combines neuroscience, pseudoscience, and the paranormal.

A few major skeptical blogs are members of umbrella sites. Phil Plait's Bad Astronomy (http://blogs.discovermagazine.com/badastronomy/) is hosted by *Discover* in a collection of science-related sites. Science Blogs (http://scienceblogs.com/) features seventy-five sites from a wide array of scientific disciplines, including *Pharyngula* (http://scienceblogs.com/pharyngula/) by P.Z. Myers. The skeptic known as Orac of Respectful Insolence (http://scienceblogs.com/insolence/) organizes the "Blog Carnival" on the Skeptics' Circle (http://skepticscircle.blogspot.com/), whereby a biweekly host publishes announcements and reviews about recent blog posts.

Some blogs are collaborative efforts featuring several writers and a high turnover of content. Skeptic Blog (http://skeptic-blog.org/) offers topical discussion pieces by Michael Shermer, Skeptoid podcaster Brian Dunning, and skeptic Yau-Man Chan of TV's *Survivor*.

Skepchick (http://skepchick.org/blog/) is a collective blog created by Rebecca Watson. This group of female skeptics (and one male) provides multiple daily posts about topical issues. The writers represent a broad range of backgrounds and include a geologist, an entomologist, and a linguist (me). Swift (http://www.randi.org/site/), the James Randi Educational Foundation's blog, publishes daily posts by James Randi, Phil Plait, Harriet Hall, and other contributors. The Center for Inquiry presents Free Thinking (www.centerforinquiry.net/blog), which includes articles by Point of Inquiry podcaster D.J. Grothe, CSI investigator Joe Nickell, the SKEPTICAL INQUIRER's Ben Radford, and *Free Inquiry*'s Tom Flynn.

Skeptical blogging is certainly on the rise. In fact, some people only know skepticism through the Internet, especially via blogs. In a sense, skeptical blogging is its own movement, the very essence m

Karen Stollznow is a researcher with a PhD in linguistics. She writes the "Naked Skeptic" Web column for CSI, the Skepbitch blog, and is a contributor to Skepchick, Swift, and the San Francisco Bay Area Skeptics' blogs.

New Anthology to Showcase Skeptical Blogs

Read any good skeptical blogs lately? Inquiring minds want to know! In this case the minds in question belong to the Young Australian Skeptics (www.youngausskeptics.com) and the Critical Teaching Education Group (http://criticalteaching.org), who are compiling the very best blogs of 2009 in the *Skeptical Blog Anthology*. And they want *your* nominations.

According to Elliot Birch, creator of Young Australian Skeptics, "The anthology is an attempt to bring a greater awareness of the skeptical content on blog sites and showcase some of the range and diversity in the blogosphere. [It] . . . aim[s] to provide text-based resources to classes and general readers who may be interested or intrigued by what skepticism has to offer."

Blog entries posted between January 1 and December 1, 2009, are eligible for inclusion in the anthology, which will be available in both print and electronic formats through Lulu.com in early 2010. For more information or to nominate your favorite blog post, visit www.youngausskeptics.com/anthology/.

Don't have a favorite blog to nominate yet? Not to worry. This special issue of the SKEPTICAL INQUIRER will reacquaint you with old favorites and introduce you to some promising new ones too.

—Julia Lavarnway

Julia Lavarnway is an assistant editor of the SKEPTICAL INQUIRER.

Skeptical Books for Children and Young Adults

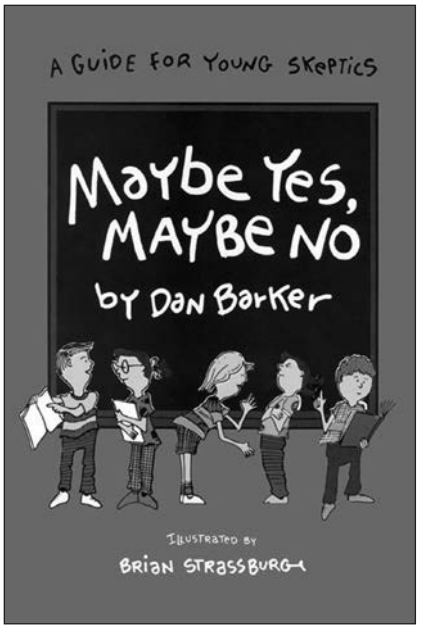
TIMOTHY S. BINGA

I was asked to write a bibliography of youth-oriented skeptical books not only because I am the director of libraries at the Center for Inquiry but also because I am beginning to look at these books for use in my private life (I have a four-year-old adopted daughter). When I began looking for these materials, I thought it would be relatively easy, but the task was more difficult than expected.

One of the challenges I encountered was finding current materials that teach critical-thinking skills or books that are specifically skeptical in nature. Another problem was that there are so few publishers of this type of material. Prometheus Books published most of the books listed here but has published little of this kind recently. Annick Press has published a few more recent works.

As a skeptical community, we need to work together to find publishers who will continue to publish these types of books. We need to supply our local libraries with these titles so they can buy them or even donate copies ourselves. We need to create a marketplace for skeptical and critical-thinking materials so publishers will see their educational importance and publish more. And, of course, we should buy the books for our children or as gifts for friends. Both authors and publishers of these skeptical books need our support.

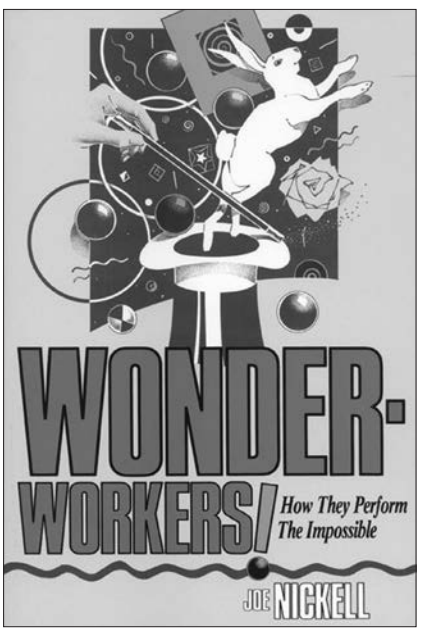
In this bibliography, I tried to supply the most appropriate ages for these works. Young adult usually means from nine to fourteen years old; unless noted otherwise, these books are meant for that age range.

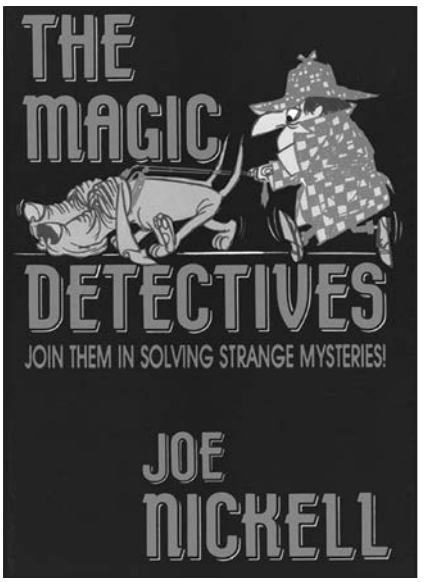


Maybe Yes, Maybe No: A Guide for Young Skeptics. Dan Barker and Brian Strassburg (Illustrator). Amherst, NY: Prometheus Books, 1990. This book teaches critical-thinking skills and is intended for six- to ten-year-olds.

How Do You Know It's True? Discovering the Difference between Science and Superstition. Hyman Ruchlis. Amherst, NY: Prometheus Books, 1991. Aimed at young adults, this book explains the differences between science and superstition and the basics of the scientific method.

Wonder-Workers! How They Perform the Impossible. Joe Nickell. Amherst, NY: Prometheus Books, 1991. This book, by the venerable Joe Nickell, gives a biographical treatise on those who apparently were "Wonder-Workers." Houdini, Robert-Houdin, Edgar Cayce, Lulu Hurst, and Peter Hurkos are a few who appear in this work written for young adults.





The Magic Detectives: Join Them in Solving Strange Mysteries. Joe Nickell. Amherst, NY: Prometheus Books, 1989. This book is similar to those "minute-mystery" style books in which the reader is encouraged to solve the mystery, and the answer is provided upside-down following the story. It includes many actual mysteries investigated by Nickell and is best for young adults.

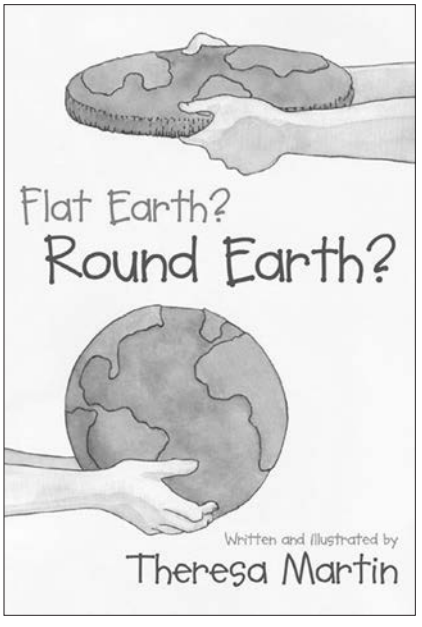
Sasquatches from Outer Space: Explor-

ing the Weirdest Mysteries Ever. Tim Yule and Keith Baxter (Illustrator). Amherst, NY: Prometheus Books, 2000. In the introduction, author Yule says that he is looking at many of the world's best-known mysteries—Bigfoot, aliens, and many other types of paranormal and supernatural phenomena—and applying science to them. This book is intended for nine- to twelve-year-olds.

Alexander Fox and the Amazing Mind Reader. John C. Clayton and Emily Egan (Illustrator). Amherst, NY: Prometheus Books, 1998. Sixth grader Alexander Fox investigates Mr. Mystikos, who helps people find lost objects. Recommended for eight- and nine-year-olds.

Bringing UFOs Down to Earth. Philip J. Klass. Amherst, NY: Prometheus Books, 1997. This book is meant for ages nine to twelve. It describes what Klass looked for when investigating UFO claims and gives a history of some well-known alleged UFO sightings.

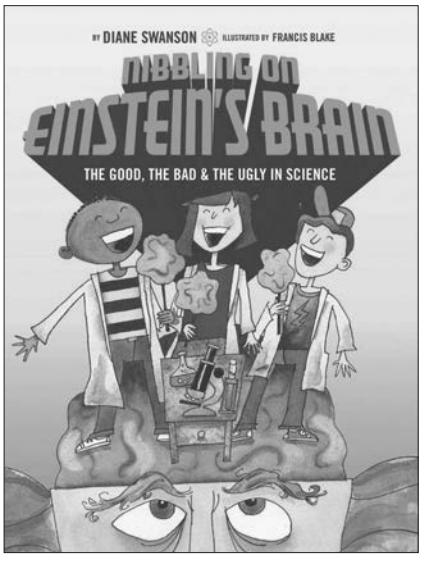
Flat Earth? Round Earth? Theresa Martin. Amherst, NY: Prometheus Books, 2002. This work is best for children ages four to eight. A student steadfastly refuses to believe the Earth is round and is given examples why it is so. The theme here is to think on your own and to question common knowledge or belief.



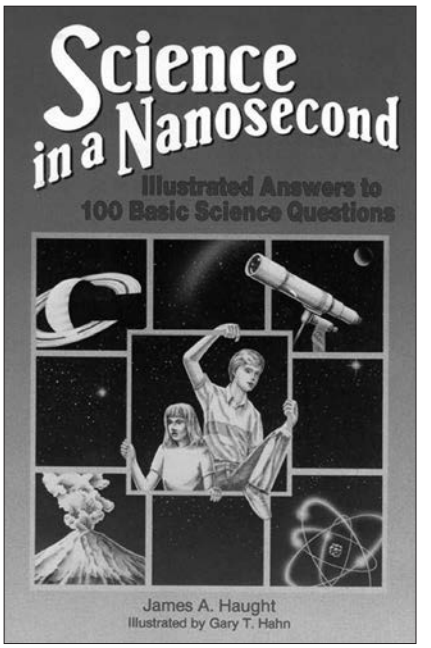
The Evolution Book. Sara Stein. New York: Workman Publishing, 1999. Stein gives a scientific overview of life on Earth using biology and natural history. Suggested for ages ten to fourteen; based on some of the activities used to help illustrate the concepts, you might want to be at the older end of the range.

How Come? Every Kid's Science Questions Explained. Kathy Wollard and Debra Solomon (Illustrator). New York: Workman Publishing, 1993. This work is recommended for young adults and is a compilation of columns from the "How Come?" series that appears in *Newsday* and the *Los Angeles Times*. It covers many questions, including the favorite of parents and children everywhere: "Why is the sky blue?" I also recommend their other books (like *How Come? Planet Earth*).

Nibbling on Einstein's Brain: The Good, the Bad and the Bogus in Science. Diane Swanson and Francis Blake (Illustrator). Toronto, ON: Annick Press, 2009. This is an updated work for nine- to twelve-year-olds. It's an excellent book about critically examining claims that illuminates the differences between good and bad science.



Science in a Nanosecond: Illustrated Answers to 100 Basic Science Questions. James A. Haught. Amherst, NY: Prometheus Books, 1991. Best for young adults, this book gives basic science answers similar to the *How Come?* books mentioned above.



The Little Book of Big Questions. Jackie French and Martha Newbigging (Illustrator). Toronto, ON: Annick Press, 2000. This book is suited for ages nine to twelve and covers a wide range of areas, including morality and life and death, as well as topics like extraterrestrials. □

Tim Binga is director of CFI Libraries.

Talking Skepticism to Generation Y

JUSTIN TROTTIER

If anyone ever wonders just what impression a skeptic's words, stories, explanations, and arguments have, there's no better test than a live performance in front of wide-eyed sixteen-year-olds—natural critics, skeptics, and oftentimes cynics. I was put through a grueling ordeal recently when I gave two back-to-back presentations explaining my worldview to the private Greenwood College School in Toronto.

I started with the premise that critical thinking as a methodology is the main divide between skeptical inquirers and scientific naturalists and those whose worldview is based on other ways of knowing. I then explained how such a methodology, when applied to different scopes of inquiry, leads to both the secular humanist worldview and skepticism of the paranormal.

As it turned out, the students were proficient critical thinkers, although critics might be a more apt label. Here are some dos and don'ts they taught me that might be of use to anyone attempting to introduce skeptical thinking to Generation Y, or, as some call them, the Entitlement Generation.

DO explain the major tools for critical thinking and argumentation. No high school I know of has a course in critical thinking, and few do a good job of introducing the real spirit of how science approaches questions beyond the stale list of steps given almost as the doctrine of the Scientific Method. These independent presentations are therefore ideal opportunities to rectify that lacking. However . . .

DO NOT engage in long blackboard lessons. My attempt to introduce the concept of skepticism and critical thinking through a history of the various schools of philosophy going back to the ancient Greek Pyrrhonians did not go over well. The presentation was too detailed and abstract and probably too similar to an everyday classroom lesson. Clearly the students were anticipating a break from that and wanted engagement in more interactive discussions.

DO incorporate multimedia where appropriate. My presentations included excerpts from Richard Dawkins's *Enemies of Reason*, featuring a simple double-blind test debunking water dowsing and a short interview on the dangers of spiritualism addiction with famous magician Darren Brown, with whom many of the students were familiar. We listened to a clip from a *Point of Inquiry* episode featuring Andrew Fraknoi on our body's cosmic history. Finally, we watched an excerpt from *Here Be Dragons*, a video that serves as a critical thinking primer from *Skeptoid* podcast host Brian Dunning. This led into a discussion of the red flags and keywords of pseudoscience, such as "ancient wisdom," "energy fields," "all natural," or simply ads featuring a man in a lab coat.

DO incorporate interactive games. To investigate the veracity of the newspaper horoscopes many of the students read, students were divided along the wall of the room based on zodiac sign. The day's horoscope was then read from a local newspaper and each student was asked to identify whether the descriptions did or did not apply to their day. Unbeknown to the students, a deception was taking place, for students in fact read from the horoscope that corresponded not to their own sign but to the one following theirs. Upon completion, we tallied the number of "hits" and "misses," compared them to what might be expected by chance, and then announced the deception.

DO NOT read FAQs directly. I prepared well-articulated answers to a self-created list of Frequently Asked Questions, such as "Why are you concerned with people's personal beliefs" and "Would any evidence convince you of paranormal activities beyond science?" Although these made me feel I had gone through all my material comprehensively, it left little time for answering the student's own questions and probably made me appear overly distant. So . . .

DO interact directly with the students. It would be much better to first entertain questions from students in order to respond to the exact nuance and examples given by a questioner and *then* read from any remaining FAQs that have not been covered. Other more creative interactive activities might have the students reflect on the possible bias or misrepresentation of particular science articles in the newspaper or ask them to apply critical thinking to a contemporary political issue or the recent speech of a local politician.

DO personalize the presentation. I provided a short background to the events that lead me to adopt a skeptical and secular humanist worldview. I included a slide with names and photos of famous skeptics and freethinkers from lots of different fields—scientists, philosophers, authors, lawyers, politicians, activists, and celebrities.

DO take the opportunity to promote the wonders of science. This is a good opportunity to excite students by explaining how science affects our lives and our society. I covered the scientific outlook, focusing on science that speaks to our biggest questions—evolution, cosmology, and neuroscience—as well as the scientific revolution's historical ties to notions of democracy, freedom, and progress. Much of this science is covered in technical detail in classes but would never have been tied to these larger societal issues.

DO define new terms like *skepticism*, *atheism*, *secularism*, *naturalism*, and *methodology*, but . . .

DO NOT over-define. Differentiating between weak and strong atheism, for example, will probably confuse the bigger issues.

DO NOT leave students with homework, but . . .

DO leave students with handouts. I ended by passing out copies of the SKEPTICAL INQUIRER and *Free Inquiry* magazines, skepticism-themed stickers, excerpts from Carl Sagan's *Demon-Haunted World*, and a list of books, podcasts, and films of interest.

While the experience was exciting and the presentation well received, I will be making some fairly substantial changes before I speak again later this year. Rules of thumb when dealing with young students: simple is better, leave extra time, focus on quick multimedia excerpts, and favor discussions and questions over a prepared history lesson.

I better learn my lessons quickly; although my first experience was in front of a small private school and uniformed students, my next will put me in front of inner-city youth in a much tougher neighborhood!

For those interested in contacting schools in their area, all my presentation materials—including PowerPoint presentations, accompanying notes, and copies of multimedia—can be found at the Center for Inquiry/Ontario Web page: www.centerforinquiry.net/ontario/local_resources/high_school_presentation/. I would be happy to provide consultation upon request. □

Justin Trottier is executive director of the Center for Inquiry/Ontario.

Skeptical Programs for Generation Y and Beyond

BARRY KARR

The Committee for Skeptical Inquiry (CSI) has many long-standing programs to encourage critical thinking in children and young people—the world's future skeptics.

For at least fifteen years, we have supported the Presidential Awards for Excellence in Mathematics and Science Teaching program (PAEMST), which is the highest presidential honor for the teaching of mathematics and science in the United States. Each year 108 outstanding teachers of mathematics and science at the elementary and secondary education levels are honored for their contributions to teaching and learning. We donate a gift subscription of the SKEPTICAL INQUIRER to each and every recipient of this award because we feel it is important for us to support these wonderful teachers as they educate our future generations.

Over the years, we have provided scholarships to a number of students (in both high school and college) attending various CSI events, including our national and regional conferences and events like the Skeptic's Toolbox, held annually at the University of Oregon. We have also provided a number of research fellowships to students studying in the fields of science and anomalistic psychology at institutions like Goldsmiths College in London and the University of Hertfordshire under the direction of such famed lecturers as Christopher French and Richard Wiseman.

As I write this update, the Center for Inquiry Institute is underway here in Amherst. Joe Nickell is conducting a workshop on investigating the paranormal. Along with a number of participants from around the United States, we have helped sponsor three students from Russia and two from China. We have also offered an internship program for young people interested in learning about science and reason to work with us on projects such as running conferences and establishing local groups.

We have received well over 300 requests from textbook publishers, university professors, newspapers, magazines, local skeptical and humanist groups, and even television shows and movie producers to include material originally published in the the SKEPTICAL INQUIRER in their works. We try to accommodate as many of these requests as we can because we know this material will continue to have an effect long after the magazine is put down.

CSI has also published a number of anthologies of SKEPTICAL INQUIRER articles. At least two of these books, *The Outer Edge* and *Bizarre Cases*, have been used by colleges across the United States for courses ranging from psychology to logic.

CSI and the SKEPTICAL INQUIRER field scores of requests from school children around the world for information on UFOs every year. Photocopying selected articles to send in response to their questions became too much for us, so CSI published a book for young children called *Bringing UFOs Down To Earth* by Philip J. Klass to act as a primer on UFOs using terms and examples that children would find useful, entertaining, and educational. We gave away so many copies over the years that Prometheus Books eventually published a version in their children's book series for far wider distribution.

One of CSI's crowning achievements in reaching and teaching young skeptics is our involvement with the Camp Inquiry program. This year was our fourth participating in the program, and we are delighted to report that it was the biggest year yet, with forty-five campers aged seven to sixteen taking part in the weeklong event. The Camp Inquiry Web site states: "We think kids are uniquely situated to enjoy a new 'Age of Discovery.' Where others may see turbulent seas and dangerous impasses, we see opportunities—to create, to forge new paths, to open new communications, to tell new stories. And the best part is, the tools have been around for ages: science, reason, and skepticism remain the best means by which to navigate these unpredictable waters."

We also help sponsor the Center for Inquiry's Campus Outreach program, which helps establish and maintain groups, programs, and activities at hundreds of colleges and universities across North America and internationally. We send campus groups issues of the SKEPTICAL INQUIRER and information flyers for promotional use at their meetings and events, help them recruit speakers, and offer training in event planning and community organizing. Each year we help bring in a number of campus group leaders to our headquarters in Amherst, New York, for training lectures and workshops and provide them with the chance to meet others who have shared similar issues and experiences.

A number of years ago, CSI developed the Superstition Bash. A fun event for the whole family, the bash includes a superstition obstacle course, psychic misreadings, and misfortune cookies. We were overjoyed to see this concept adapted by the Exploratorium in San Francisco last year, exposing the public to critical thinking about dangers and fallacies of superstition and magical thinking. Educating the next generation of skeptics is an important task, one to which we can all contribute. □

Barry Karr is the executive director of the Committee for Skeptical Inquiry.

Skeptical Parenting: Raising Young Critical Thinkers

HEIDI ANDERSON

There comes a moment in every parent's life when your child asks you the question you most feared hearing from your dear one's lips.

"Mom?"

"Yes, honey?"

"Where did people come from?"

"You mean babies? Well, um, first the man takes his penis and . . ."

"No, no, I mean the very *first* people. Where did the first people on Earth come from?"

I was dumbfounded. What could I say? I knew this moment was coming and yet was completely unprepared. I would be more than happy to discuss sex with him, but evolution? How could I explain evolution to my three-year-old when I myself was fuzzy on the process? I was, after all, the product of the South Carolina public education system.

And that is when I said the worst possible thing any parent can say to a child asking about this controversial subject. No, I did not tell him that we came from God or that we were planted here millennia ago as an extraterrestrial experiment. I told him something much, much worse.

"Baby, one day monkeys turned into people."

Skepticism is a worldview that has come to me slowly over the years, under less than illustrious circumstances. Although I had been an atheist for years, I was not practicing critical thinking and had never heard of skepticism. Due to hormonally-based "appreciation" of a certain skeptical magician, I began to listen to the now-defunct *Penn Radio* show. One of his guests was Phil Plait, the Bad Astronomer. After hearing Phil on the show, I went to his blog and was hooked. With Penn and Phil acting as the gateway drugs of skepticism, I quickly found myself needing harder and harder fixes. I listened to *Point of Inquiry* and *Skepticality*, read the blog of P.Z. Myers, and devoured the writings of both Richard Dawkins and Neil de Grasse Tyson. Ultimately, I went to the source of the love and appreciation of science and critical thinking for many of us in the movement, the works of Carl Sagan. He was my heroin of skepticism. There was no going back to the dark for this small-town Southern girl. I had become a full-blown skeptic.

Heidi Anderson is the development coordinator for a domestic violence/sexual assault services agency in Spartanburg, South Carolina. She is the mother of two incredibly smart sons and the wife of one incredibly patient man. She can be reached through her Web site, www.fatoneinthemiddle.com, where essays on skepticism, parenting, sexuality, and body image can be found.

Although being a skeptic usually involves many, if not all, aspects of a person's life, turning the skeptical lens on our personal lives is sure to bring attention to the most sacred of cows. How do you put critical thinking into practice without losing friends and alienating family? Although my husband and I had agreed to raise our children without religion, I found myself wanting to go even further. I wanted to help my children develop critical thinking skills I had only recently acquired myself.

Why Parent at All?

Many of the skeptical parents I talked with came to skepticism after having children and admitted that choosing to become a parent was not always a rational decision. Even for those of us who planned our parenthood, many of us did it because it just "felt right" or seemed like the "right next step" in our life plan. Though not logical, our love for children and desire to have them was reason enough. Sara Rosinsky of Lakeland, Florida, admits that choosing to have a child was a "bit of a leap of faith," an approach that can be quite foreign to many skeptics. Jason and Kim Bilotta of Punta Gorda, Florida, said that although they discussed the pros and cons of having children, they are not entirely sure if the decision could be considered rational.

Of course, having children greatly reduces free time available for skeptic-related activities. Blogs, books, and magazine articles can get pushed to the wayside after the arrival of children, and funds that would go to registration at the Amaz!ng Meeting or a Center for Inquiry conference often go for private school tuition or medical care (not that I am bitter). In

fact, it is not surprising to this author that many of the most prolific writers/activists/members of this movement are either women without small children or men.

Raising Skeptics

Once parenthood is achieved—by choice or by happenstance—the challenge of raising a child to be a critical thinker begins. So many of us were indoctrinated with a religious or political worldview as children and want nothing more than to avoid indoctrination in our own families. So what should the goal be? Are we trying to raise a flock of miniature James Randi clones? Do we want to tell our children what skepticism says the world is or, as Jeff Wagg, communications director for the James Randi Educational Foundation, says, accept that "the process teaches kids to think about things." Critical thinking and science are tools to learn about the world, and teaching our children to correctly use these tools will help them not only to understand the true nature of the world but be the innovators and visionaries of the next generation.

Children are born scientists. Toddlers are tiny behavioral psychologists taking detailed notes on just how many times the large people in charge will bend over and pick up the sippee cup hurled at their heads. This curiosity can be harnessed and used for less painful lessons by encouraging a dialogue with your child. When your child asks you why the sky is blue, which Jeff Wagg claims is a deceptively complicated answer, ask her what she thinks and then research the topic together. You can even help your child design experiments; you can ask her what her hypothesis is and then help her to test and retest the hypothesis to form a theory. This works especially well in crowded stores when she asks you what you are going to do if she refuses to stop screaming at you while stamping her feet!

Science can be woven into children's lives at every opportunity. Sara Rosinsky, mother of ten-year-old Helen, says that "Science is the soundtrack by which we live our lives." There are many new and amazing resources available for bringing science to children. One of my favorites is www.CharliesPlayhouse.com, an online store with games and toys inspired by Charles Darwin. Children also love dinosaurs, a trait the Creation Museum in Kentucky exploits to get bodies in the door. Even children, though, can understand the foolishness of believing that dinosaurs and humans lived together in harmony before the fall of man or that the giant, sharp teeth of Tyrannosaurus Rex were used to eat plants before Eve ruined everything by eating the apple. The Creation Museum does score points, however, by offering children the chance to ride a triceratops. Science needs to work on that—perhaps by cloning!

The Real World

Although most of the parents I talked to were raising children with fellow skeptics, this is not always the case. Although my own lovely husband refuses to call himself a skeptic, he has been my best resource in learning the value of critical thinking. Perhaps it is less important that we wear the same team hat and more important that we agree on the importance of using evidence over faith in making decisions.

A few of the single parents I talk with struggle with exes who want children involved in organized religion. Even for those of us who are married to skeptics, extended family often presents many opportunities for children to be exposed to pronouncements about the world with which we disagree. In these instances, I find it helpful to tell my children that religion is what people "believe," not what "is."

The Creation Museum does score points by offering children the chance to ride a triceratops. Science needs to work on that—perhaps by cloning!

When my children go to church with their grandparents, I tell them that while a man named Jesus probably existed 2,000 years ago, some people think he was the son of god and other people do not. I then tell my children that I see no evidence that such claims are true or that the Bible is anything other than a book of stories. We have also used the fantastical nature of biblical stories to explore the validity of miracles, and we question the lack of miracles present today. This approach must also be tempered with a warning to children to use discretion in talking with family and friends about religion. Grandma and Grampa may not be ready to hear their precious grandchild talk like Nietzsche.

Holidays and cultural celebrations can cause strife with family and friends but can also be used as another opportunity to teach critical thinking. It seems that many skeptics do what Michael Blanford, president of the Skeptical Society of St. Louis and father to three-year-old Atom, calls the "half-assed Santa" approach—you don't tell the children there is a Santa but don't tell them Santa is fake either. When the child is old enough to ask questions, the whole thing is presented as an exercise in skepticism, and the child is helped in drawing the correct conclusions through scientific inquiry. Brad Fusilier, president of the Southern Skeptical Society and father of four, asks his children "Why wouldn't Santa be able to deliver 2.2 billion presents in twenty-four hours with or without time zones?" Again, though, as with religion, children must be warned that these matters should not always be discussed with other children. Hell hath no fury like a mother whose child has been told the truth about Santa against her will.

Skeptic parents consider the love of learning one of the most important values to pass on to their children. They often see themselves as their child's first teacher and seek out the highest quality education available. Many of the people I talked to were fortunate enough to live in areas with excellent public schools and had no qualms about sending their children there. Others, like Myndee White of Lakeland, Florida, mother of sixteen-year-old Kyree, fourteen-year-old Nate, and eleven-year-old Tyson, found their best solution was to home-school the children for much of their educational career. Myndee tries very hard to keep the study of science fun and relevant to everyday life and has particularly enjoyed the *Growing Up in the Universe* series by Richard Dawkins. Still others, myself included, have chosen to send our children to private school to avoid poor-quality public schools and the lack of inquiry-based curriculum. (Plus, public school teachers in my town seem to be unappreciative of a child who respects evidence over authority!)

Before anyone reports me to Child Protective Services or, worse, to Richard Dawkins, I did go back and explain evolution to my child correctly. I told my son that I was not sure how evolution worked, and we went to the library and read as many books as they had on the subject. I then went online and ordered many amazing books on evolution written especially for children. (See Center for Inquiry librarian Tim Binga's piece "Skeptical Books for Children and Young Adults," on page 43.)

The point of that story is not that I was an idiot but that I took a question from my child and used it as an opportunity to help him learn the process of critical thinking. Instead of passing dogma down from generation to generation, skeptical parents seek to teach their children the importance of inquiry. Inquiry, and the willingness to consider ideas on the merit of their evidence, can make parenting more complicated and certainly more mentally exhaustive, but the results speak for themselves.

When one of my son's friends told him that he had a ghost in his house and that the friend's mother "confirmed" the story, my son was not frightened at all. He simply looked his friend in the eye, raised his eyebrow, and asked, "Where is your evidence?"

I have never been more proud in my life. □

Skepticism 2.0

D. J. GROTHE

When Carl Sagan, James Randi, Paul Kurtz, Martin Gardner, Ray Hyman, and others came together in the mid-1970s to form the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP, now CSI), did they plan on starting a worldwide grassroots critical-thinking movement? Did they craft a plan to deputize everyday people to speak out in their communities about the prevailing nonsensical ideas of the day? Did they envision young people meeting up regularly to be skeptical together, as in the growing Skeptics in the Pub events in cities across North America and around the world?

CSICOP

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

I doubt it. These men had the laudable ambition to organize leading thinkers and social critics to respond authoritatively to growing trends of credulity in society: increased belief in the power of psychics, the phenomenon of Uri Geller, UFO beliefs, ancient astronaut theories, popular belief in ghost hauntings and channeling, faith healers and religious charlatans, and the like.

The founders of CSICOP succeeded admirably by many measures: they published magazines and books, spoke out in the entertainment and news media (including on *The Tonight Show Starring Johnny Carson*, which repeatedly featured CSICOP founders), and convened national and regional conferences for subscribers.

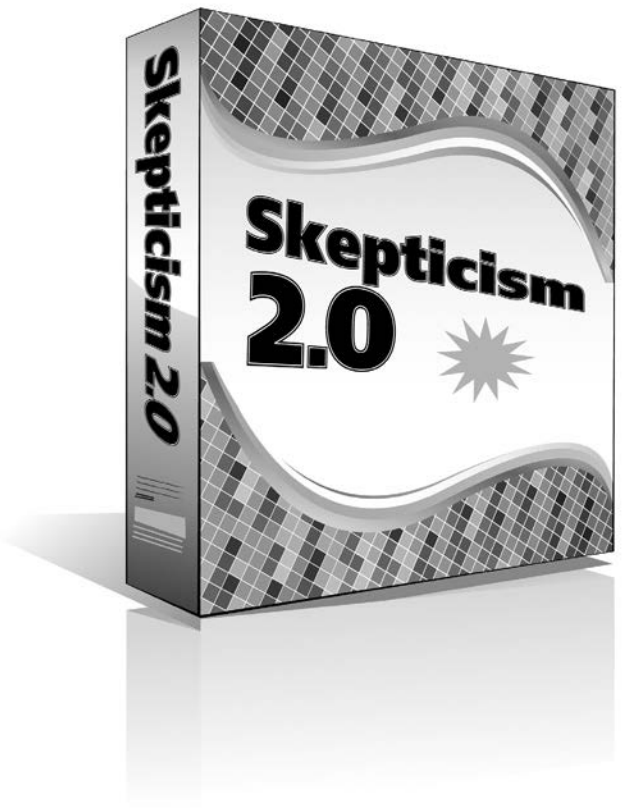
But I submit that they didn't plan a movement from the start. The movement grew organically around the ideas that CSICOP and the SKEPTICAL INQUIRER, and later other skeptical organizations and magazines, promoted.

Within about a decade of the SKEPTICAL INQUIRER's launch, the members of the educated public who subscribed found that it wasn't enough for them to get a magazine about skepticism in the mail four or six times per year. So CSICOP helped found local skeptical organizations, often at the behest of subscribers in a given area, initially drawing from CSICOP's own magazine subscriber lists. Groups were formed in the Washington, DC, and Los Angeles regions and in a number of other cities around the U.S. and abroad. A movement, not merely a magazine, was beginning to form.

In recent years, new developments in technology and society have allowed this skeptical movement to reach out in new directions, sometimes departing from tested ways of advancing the skeptical outlook that have worked in the past. This is the next generation of skepticism. This is Skepticism 2.0.

New Media for New Audiences

Often citing inspiration from the founders of CSI, an "average Joe" skeptical citizen, possibly without special training or background in skepticism and with the help of only a computer connected to the Internet, can reach out to an audience that the skeptical magazines and organizations never would have reached



just a few years ago. Blogs, podcasts, and social networking sites such as Twitter and Facebook allow anyone—including skeptics and believers—to advance a point of view to the wider public.

Promise and Problems of Skepticism 2.0

Podcasts such as the New England Skeptical Society's *Skeptics Guide to the Universe*, online communities such as the one found at the James Randi Educational Foundation's Web site, and blogs such as Rebecca Watson's Skepchick.org shine as examples of Skepticism 2.0, as do amateur skeptical projects

Blogs, podcasts, and social networking sites such as Twitter and Facebook allow anyone—including skeptics and believers—to advance a point of view to the wider public.

such as Tim Farley's WhatstheHarm.net and the growing SkeptiCamp events started by Reed Esau. But local individuals and groups using the Internet to reach out to and inform the public about skepticism can do only so much.

The national organizations, such as CSI, offer an opportunity for inspired local activists and groups to avoid "reinventing the wheel" and may provide valuable promotional and underwriting support of important new local projects, as well as offer expertise on various skeptical topics (Joe Nickell's work comes to mind). Even more important is the professionalizing of the movement, which the national organizations allow for and encourage. A case in point is skeptical campus outreach: a national organization, with the support of donors and a paid staff, can impact campuses in joint effort with local activists in ways that neither can do alone.

Skepticism's cultural competitors (purveyors of "woo woo," as James Randi would call them)—the New Age movement, alternative medicine hucksters, UFOlogists, etc.—often draw on the resources and organizational power of national groups devoted to pushing those agendas. The same should be true of the next generation of the skeptical movement, Skepticism 2.0.

Skeptics in the Pub and the Future of Skepticism

Over the last few years, fueled primarily by Internet outreach through social networking Web sites, Skeptics in the Pub and similar activities (skeptical meet-ups and Facebook groups, etc.) have cropped up in dozens of cities, often independent of preexisting local or national skeptical organizations.

What happens when these groups grow and their members want to "take it to the next level"? New local groups are formed with structure, leadership, and programs. Money is raised, membership programs are created, and if all goes well staff is hired and buildings are bought. In other words, new national organizations may grow out of the local and independent projects of Skepticism 2.0. But is that the best path to plot if the movement is to be plotted and planned?

I think a better model is for independent local projects—the successful examples of Skepticism 2.0—to find organizational homes. When they need resources, they should look to the long-standing local and national organizations for support. They should be part of the *organized* skeptical movement, not outside of and apart from it. □

You can make a lasting impact on the future of skepticism… when you provide for the Skeptical Inquirer® in your will.

CSI and the SKEPTICAL INQUIRER changed the terms of discussion in fields ranging from pseudoscience and the paranormal to science and educational policy. You can take an enduring step to preserve their vitality when you provide for the SKEPTICAL INQUIRER in your will.

Your bequest to CSI, Inc., will help to provide for the future of skepticism as it helps to keep the SKEPTICAL INQUIRER financially secure. Depending on your tax situation, a charitable bequest to CSI may have little impact on the net size of your estate—or may even result in a greater amount being available to your beneficiaries.

We would be happy to work with you and your attorney in the development of a will or estate plan that meets your wishes. A variety of arrangements is possible, including: gifts of a fixed amount or a percentage of your estate; living trusts or gift annuities, which provide you with a lifetime income; or a contingent bequest that provides for the SKEPTICAL INQUIRER only if your primary beneficiaries do not survive you.

For more information, contact Barry Karr, Executive Director of the Committee for Skeptical Inquiry, at 716-636-1425. All inquiries are held in the strictest confidence.

State-Sponsored Quackery

Feng Shui and Snake Oil for California Nurses

The Independent Investigations Group investigates pseudoscience—particularly therapeutic touch—in professional nursing. Just how well regulated is nursing in California?

OWEN HAMMER and JAMES UNDERDOWN

The California Board of Registered Nursing (CBRN) oversees and licenses more than 350,000 registered nurses in the Golden State.[1] Nurses in California must complete thirty hours of continuing education units (CEUs) every two years to remain licensed. These units must be issued by certified CEU providers and "must be relevant to the practice of nursing."[2] The courses may, however, be related to topics as varied as "social and behavioral sciences . . . therapeutic interpersonal relationship skills. . .and nursing administration."[3]

There is no ongoing reporting mechanism to keep track of each individual's CEUs. Nurses comply based on the honor system but are expected to submit proof of coursework if

Jim Underdown reaches into an anatomically correct rubber corpse and flings an armful of bloody latex entrails onto a stage to divine the future.

requested. Correspondence courses can qualify for credit, and the board requires little substantiation that anything has been learned.[4]

A Tectonic-sized Crack in the System

The Independent Investigations Group (IIG) at the Center for Inquiry/Los Angeles has been an active skeptics group since January 2000. When we at the IIG learned that a nursing CEU provider called Clearsight was offering credits for a class in "energetic medicine," we investigated. "Energetic medicine" is Clearsight's name for therapeutic touch (TT), the manipulation of alleged energy fields such as chakras and auras over the body. (The practitioner's hands make no actual contact with the patient.) Clearsight advertised that they were licensed by the state of California to teach the following to registered nurses:

> The skills of "seeing energy" to see and diagnose body organs; to scan the physical and energetic bodies for dis-harmonies or illness; and to heal the aura and chakras, the energetic systems of the body.
>
> Clearsight introduces you to the skills of Free Will, the art of energy diagnosis, how to make Separations from your Healee so you do not take another person's energy or dis-ease home and how to release old patterns and stuck energy in your body and auric field. When you use Clearsight healing skills you clear and clean the entire energy field (chakras, channels and aura) and grow and evolve evenly at the rate of growth you are ready to access.[5]

Our shock at discovering that such a pseudoscientific course had been sanctioned by an ostensibly scientific government agency led us to inquire about Clearsight's application. Had Clearsight defrauded the CBRN in order to cash in on the CEU market?

Sacramento, We Have a Problem

After some prodding to remind the CBRN that Clearsight's provider application was public record, the IIG received a copy of the application and discovered that it was blank in some places and that the instructor's educational credentials consisted of a BA in comparative religion and a ministerial certificate from the Church of Divine Man—a psychic institute that offers healings, psychic readings, and other such activities.[6] The application also made the unsubstantiated claim that "medical science has recognized and quantified the existence of a human energy field which, when blocked, may result in a broad range of physical and psychological ailments."[7]

From January to May 2006, IIG investigators had a frustrating series of exchanges with the nursing board. Initially, we asked that they withdraw Clearsight's certification to teach energetic medicine based on the omissions in the application and the lack of supporting medical value for the practices being taught. We naively thought that after we pointed out

Owen Hammer is an investigator with the IIG and a writer and visual effects artist in Hollywood. James Underdown is the executive director of the Center for Inquiry/Los Angeles and the chair and founder of the Independent Investigations Group. He can be reached by e-mail at jimu@cfiwest.org.

these (what we thought were stunning) revelations, the board would recognize their oversight and withdraw Clearsight's certification to teach New Age malarkey. We had no idea our odyssey was just beginning.

In a February 2006 letter, then CBRN Executive Officer Ruth Ann Terry wrote to IIG investigator Owen Hammer that "nurses . . . need to be informed about these techniques in order to understand the patient's/client's perspective and learn what is involved in each technique."[8]

IIG Chair James Underdown addressed the board personally in May and June of 2006 and argued that Clearsight's course was not a class *about* energetic healing; it was a course *teaching* (i.e., endorsing) energetic healing, an unscientific concept. The IIG submitted a proposed rewrite of the current rules that would help prevent future lapses in science standards.

The current rules say (in effect) that content must be relevant to the practice of nursing, related to scientific knowledge, *or* related to client care.[9] Our proposed change was that content must be relevant, scientific, *and* related to client care. We also submitted a clause clarifying the definition of *scientific* and a change providing for automatic withdrawal of certification from CEU providers who give false information on an application.

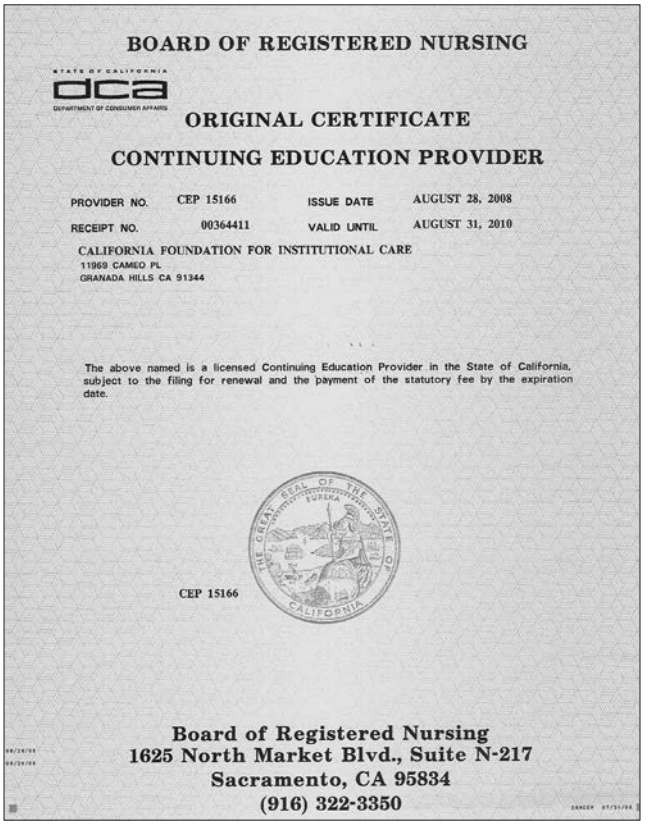
The IIG then contacted the California Department of Consumer Affairs, which oversees nursing regulations, and received a reply in July 2006 that defended the granting of Clearsight's certification. In August 2006, Underdown addressed the board's Education/Licensing Committee in Sacramento. There, the IIG was informed[10] that the board will "award a CE Provider number to the applicant if the alternative or complementary medicine modality is discussed in the publication *Best Practices in Alternative and Complementary Medicine*."[11]

Best Practices, which would be key to our investigation, is a hard-to-find publication that is regarded by the board as its guidepost to educational policy. It contains sections on TT, magnet therapy, Reiki, aromatherapy, homeopathy, and qigong. The material on these topics is highly credulous[12] despite poor scientific support and wide criticism in the SKEPTICAL INQUIRER and other journals. The board nevertheless defended the licensure of energetic medicine classes and other alternative medical practices by citing *Best Practices* as an acceptable standard.

After an exhaustive search, we found *Best Practices* in a library and carefully read the sections that dealt with TT. We then crafted a comprehensive, well-documented refutation of *Best Practices*'s TT claims and sent copies of this refutation to each board member. This was in addition to literature we had already given the board, including material from Robert Park's SI piece "Alternative Medicine and the Laws of Physics"[13]; "A Close Look at Therapeutic Touch"[14] by Linda Rosa, Emily Rosa, Larry Sarner, and Stephen Barrett (in *The Journal of the American Medical Association*); and Kevin Courcey's "Further Notes on Therapeutic Touch," which is available online at www.Quackwatch.org.

Oddly enough, Rosa et al's *JAMA* paper was cited in the *Best Practices* literature despite the fact that it elegantly refutes claims that TT works!

The board promised to consider our suggested changes to the regulations, but we never heard from them or saw any sign that the item was listed on any subsequent board agenda or addressed at any meeting. We were stonewalled.



BOARD OF REGISTERED NURSING

STATE OF CALIFORNIA
DEPARTMENT OF CONSUMER AFFAIRS

ORIGINAL CERTIFICATE

CONTINUING EDUCATION PROVIDER

PROVIDER NO. CEP 15166 ISSUE DATE AUGUST 28, 2008

RECEIPT NO. 00364411 VALID UNTIL AUGUST 31, 2010

CALIFORNIA FOUNDATION FOR INSTITUTIONAL CARE
11969 CAMEO PL
GRANADA HILLS CA 91344

The above named is a licensed Continuing Education Provider in the State of California, subject to the filing for renewal and the payment of the statutory fee by the expiration date.

THE GREAT SEAL OF THE STATE OF CALIFORNIA EUREKA

CEP 15166

Board of Registered Nursing
1625 North Market Blvd., Suite N-217
Sacramento, CA 95834
(916) 322-3350

You Want Crazy? You Got It!

We then decided to see for ourselves just how lax California's CEU provider application process really is. We created a CEU provider called the California Foundation for Institutional Care—or CFI-Care (www.cficare.org)—and sent an application with the $200 fee to the CBRN. We called our course "Feng Shui for Home Care Providers" and listed IIG investigator Karen Kensek as the instructor because she teaches architecture at the University of Southern California and thus meets the qualifications of a certified instructor. But we didn't stop there.

The following sections appear on our application for this course aimed at professional nurses:

1. Möbel Kinesiology (Möbel is the German word for furniture, so möbel kinesiology is, essentially, furniture moving.)
2. Feng Shui (a practice in which a structure or site is chosen or configured so as to harmonize with its qi, or life energy)
3. Chinese Shéyóu (translation: snake oil)
4. Vapor and Reflective Surfaces (another way to say smoke and mirrors)
5. Apophenia (the experience of seeing patterns or connections in random or meaningless data)
6. Anthropomancy (divination through human entrails)

7. Canupiary Flexibility (The word *canupiary* exists in no language we could find. We made it up.)

When the unfamiliar content on our application was initially questioned, we simply pointed out that the sections we proposed were consistent with material found in *Best Practices*, the board's own gold standard for educational content. They would either have to certify CFI-Care or reject *Best Practices*.

CFI-Care was certified as Continuing Education Provider #15166 on August 28, 2008. We were officially in the for-profit business of teaching wacky ideas to professional nurses.

Feng Shui for Nurses: The Class

After much discussion about how to use our newfound state-sanctioned authority to disseminate false information, we decided to teach the class as-applied-for at the Center for Inquiry/Los Angeles. Part of the class would include revealing our motives to embarrass the CBRN into recognizing the flaws in its continuing education system. We certainly wouldn't want to see a class like "Feng Shui for Home Care Providers" taught for real.

Our shock at discovering that a pseudoscientific course had been sanctioned by an ostensibly scientific government agency led us to inquire about Clearsight's application. Had Clearsight defrauded the California Board of Registered Nursing?

In late March 2009, we issued press releases announcing that we would be teaching this state-approved class for the first time. We invited nurses, the press, and any other concerned citizens interested in the state's healthcare status. We even offered nurses free entry, free coffee, and two hours of CEU credit for attending.

But the board had one more roadblock to throw in front of us. Days after publicizing the class to the world, we received a letter (dated March 27, 2009) from CBRN Executive Officer Ruth Ann Terry stating that our certification had been "issued in error" and was now rescinded. We found it interesting that it took the CBRN *eight months* to discover this (as yet unnamed) error and only *after* our extensive publicity campaign spotlighting the folly of their approval.

We taught the class anyway, with no promise of CEUs, to an amazed and incredulous crowd. The handful of nurses who attended the class with around seventy-five others were appalled that the class's ludicrous content had been approved by the board. Jim Underdown reaching into an anatomically correct rubber corpse and flinging an armful of bloody latex entrails onto the stage to read the future was particularly memorable.

As of late July 2009, our inquiries into the reason for the revocation have been ignored.

Arnold Terminates the Board

On July 13, 2009, Governor Schwarzenegger replaced six of the seven appointed members of the CBRN.[15] The following day, CBRN Executive Officer Ruth Ann Terry resigned. It seems that while the board was taking its time responding to our objections over the teaching of pseudoscience, it was also taking its time (an average of three to five years, according to the nonprofit news organization ProPublica) investigating and closing complaints against nurses. The *Los Angeles Times* and ProPublica reported last fall that nurses with serious or multiple criminal convictions kept their licenses for years before the board acted against them.

We should note that the former board was not unanimously against our efforts and that the IIG is not taking sides regarding the replacement of the California Board of Registered Nursing. We are hopeful that the new board will take this opportunity to reexamine its continuing education polices. We will petition them to support high scientific standards in the care of California residents. Nurses and patients both deserve the best information scientific medicine can provide. □

Acknowledgements

The authors would like to acknowledge the invaluable help and dedication of the rest of the IIG with special thanks to Karen Kensek, Jim Newman, Jerry Buchanan, Wendy Hughes, and Bernie Eisenberg. They would also like to thank Linda Rosa, RN, and Wally Sampson, MD, for their advice and guidance throughout this investigation.

Notes

1. http://www.rn.ca.gov/about_us/whatisbrn.shtml.
2. California Code of Regulations, Title 16, Division 14, Article 5, Section 1456.
3. Ibid.
4. CME Resource Catalogue 2009.
5. www.clearsightaura.com/index.php?topic=engmed (accessed July 20, 2009).
6. See their Web site at http://www.c-d-m.org/.
7. Clearsight application for certification as a provider of continuing education units in the State of California, 1994. Page 1.
8. Letter to IIG investigator Owen Hammer from CBRN Executive Director Ruth Ann Terry, February 2, 2006.
9. Paraphrasing of "Nursing Practice Act with Rules and Regulations," section 1456.
10. Language copied from the official minutes for the California Board of Registered Nursing Education/Licensing Committee meeting on August 31, 2006.
11. Formally, *Best Practices in Complementary and Alternative Medicine: An Evidence-Based Approach with Nursing CE/CME* by Lynda W. Freeman. Aspen Publishers 2001.
12. The studies cited had no control group, were not blinded, were never replicated, were conducted in secret, or actually disproved the efficacy of TT.

Update on the Nibiru 2012 Doomsday

DAVID MORRISON

Public concern about doomsday in December 2012 has grown since my SKEPTICAL INQUIRER article a year ago ("The Myth of Nibiru and the End of the World in 2012," September/October 2008). The concern has invaded cable TV and Hollywood, spreading internationally. As a result, many originally unrelated threads have joined the doomsday chorus, including Nostradamus believers, a variety of eschatological Christian, Native American, and spiritualist sects, and those who fear comet and asteroid impacts or violent solar storms. All agree that terrible things will happen to the Earth in 2012, but many also assert that this will be the beginning of a new age of happiness and spiritual growth for the survivors.

This story began with predictions that Nibiru, supposedly a planet discovered by the Sumerians, is headed toward Earth. Zecharia Sitchin, who writes fiction about the ancient Mesopotamian civilization of Sumer, claimed in several books (e.g., *The Twelfth Planet*, published in 1976) that he has found and translated Sumerian documents that identify the planet Nibiru, orbiting the Sun every 3,600 years. Sitchin has sold many books about these Sumerian fables, which include stories of "ancient astronauts" called the Anunnaki who aided the Sumerians. Then Nancy Lieder, a self-declared psychic who claims she communicates with aliens, wrote on her Web site ZetaTalk that inhabitants of a fictional planet around the star Zeta Reticuli warned her that the Earth was in danger from Planet X, or Nibiru. This catastrophe was initially predicted for May 2003, but when nothing happened, the doomsday date was moved to December 2012.

These two Nibiru fables were greatly amplified when linked with the turnover of the Mayan long-count calendar at or near the winter solstice of 2012. Many Web sites sprang up declaring that December 21, 2012, would be the end of the world, a time of violent physical and spiritual transformation—never mind that the real end for Mayan civilization came several hundred years earlier with the European invasion of the Americas. This spring I counted more than 175 books on the 2012 doomsday listed on Amazon.com, where the most popular themes are the Mayan calendar and ways to survive the coming apocalypse.

Of course, Nibiru does not exist. A large planet (or a brown dwarf) in our solar system would have been known to astronomers for decades, both indirectly from its gravitational perturbations on other objects and by direct detection in the infrared. The NASA Infrared Astronomy Satellite (IRAS) carried out the first all-sky survey in 1983, which, along with several subsequent surveys, would have seen Nibiru if it was there. However, the Nibiru proponents have asserted that Nibiru was hiding—that it remained behind the Sun for several years or that it could be seen only from the South Pole. Both of these are geometrically absurd statements. Most of the so-called Nibiru photos on the Web are lens flare produced when a camera points at a bright source, an artifact also responsible for many UFO photos. As it approaches Earth, of course, Nibiru should be increasing in brightness. In fact, if it were going to be inside Earth's orbit in three years, it should have already reached naked-eye visibility, and tens of thousands of astronomers, both amateur and professional, would be tracking it.

As the story grows in complexity, many more doomsday scenarios are being suggested, often unrelated to Nibiru. These include a reversal of the Earth's magnetic field, severe solar storms associated with the eleven-year solar cycle (which may peak in 2012), a reversal of Earth's rotation axis, a 90 degree flip of the rotation axis, bombardment by large comets or asteroids, and bombardment by gamma rays or various unspecified lethal rays coming from the center of the Milky Way Galaxy or the "dark rift" seen in a nearby galactic spiral arm. A major theme has become celestial alignments, which fascinate laypersons. Supposedly, the Sun will align with the galactic center (or maybe with the Milky Way Dark Rift) on December 21, 2012, subjecting us to

David Morrison is the senior scientist at the NASA Astrobiology Institute, where, among other things, he answers questions from the public submitted to the Web-based "Ask an Astrobiologist." A fellow of the Committee for Skeptical Inquiry, Morrison is a recipient of the Carl Sagan Medal of the American Astronomical Society for his contributions to public understanding of science.

All of these pseudoscientific claims, together with distrust of the government, are being amplified by publicity for the new film from Columbia Pictures, titled simply "2012," to be released in November 2009. The film's trailer, appearing in theaters and on its Web site, www.whowillsurvive2012.com, shows a tidal wave breaking over the Himalayas with only the following words: "How would the governments of our planet prepare 6 billion people for the end of the world? [long pause] They wouldn't. [long pause] Find out the Truth. Google search 2012."

The film's publicity includes creation of a faux scientific Web site (www.instituteforhumancontinuity.org/) for "The Institute for Human Continuity," which is entirely fictitious. According to this Web site, the IHC is dedicated to scientific research and public preparedness. Its mission is the survival of mankind, and the Institute was supposedly founded in 1978 by international leaders of government, business, and science. In 2004, it claims, IHC scientists confirmed with 94 percent certainty that the world would be destroyed in 2012. This Web site encourages people to register for a lottery to select those who will be saved; a colleague of mine submitted the name of her cat, which was accepted. I learned from Wikipedia that creating fake Web sites is a recent advertising technique called viral marketing, analogous to computer viruses.

The Nibiru 2012 hoax was initially spread by the Internet. Now at least one TV cable show per week deals with this coming apocalypse. Most of these seem to be on the History Channel and the Discovery Channel. Much of the recent coverage focuses on Nostradamus (who else?), who is now credited with predicting doomsday in 2012. The story has also been reported on Fox News, and I anticipate intensified media coverage over the next three years.

The doomsday scenario is spreading internationally; about half the questions I receive about Nibiru 2012 on my Web site now come from outside the U.S. Many write from India, saying they read about Nibiru in the newspapers. A journalist said that many people in Russia "are anxious by problem Nibiru." A correspondent from Pakistan wrote, "The propaganda of 2012 is rising day by day... why is NASA not condemning these hoax?" The theme of censorship is often raised. One woman asked, "why doesn't you and your government put a ban on the TV shows and report telecasting about Nibiru. If US can step to protect the world physically from terrorism, why can't it protect us mentally from these news, if they are hoax?" Another woman pleaded, "I have four little babies and I think all of the human race deserves to know the truth from you 'experts'. If it's real then do the right thing; if not quit letting these hoaxes confuse true issues please."

I continue to receive several e-mail questions every day about Nibiru and 2012, sent to the NASA Web site "Ask an Astrobiologist" (www.astrobiology.nasa.gov/ask-an-astrobiologist/), see the box

The Nibiru 2012 hoax was initially spread by the Internet. Now at least one TV cable show per week deals with this coming apocalypse.

below for some examples received during just two weeks in May 2009. Many questioners are frightened, angry, or both. To my surprise, I have not seen much evidence that other scientists or skeptics are concerned about this growing outbreak of pseudoscience. More than a hundred past replies of mine are posted on the astrobiology Web site and also referenced on the NASA home page (www.nasa.gov). A few news blogs such as Yahoo also provide truthful answers, but these are drowned out by the 2012 hysteria. I give credit to Wikipedia, which has several entries on Nibiru, including a very good overview of the pseudoscience under "Nibiru collision." But questions keep streaming in, and I fear this will not be my last update on this subject. □

Messages to 'Ask an Astrobiologist,' May 2009

I am terrified about the recent talk about poles reversing and 2012. Do I need to prepare myself and accept this?

In late December 2012, three planets will line up correct? And the earth will pass next to the black hole in orion's belt, and turn our planet upside down. My question is, will the earth's gravity withstand it and hold us up and the oceans from going wild?

According to NASA scientists, the earth will stand still for about three days and then, in one hour, rotate a full 90 degrees (the geographical pole shift) during which time winds will be an average of 200 miles per hour. Every volcano on earth will erupt and of course there will be many earthquakes, so two thirds of earth's population will die in that one hour. Is this true??

How can an astrobiologist have anything to say scientifically about nibiru, the Shumerian planet? With scientists around the world finding facts in the existing scriptures on everything else, including Pluto, then why would we not believe them about nibiru? How can we say nibiru doesn't exist if science is only in the past few decades catching up with a science that has existed before civilized man?

There are various recent pictures and videos of an unidentified object that is beside the sun. If it is not Planet X what is it? I myself took a picture of the sun and have also captured the same object.

I am a legal administrative assistant and, having done my share of investigation, I find that the fact that the sun will pass in front of the earth and roughly eclipse the black hole at the centre of the Milky Way on Dec 21, 2012 decidedly compelling. There seems to be so much real evidence supporting the fact that something extraordinary is happening or going to happen, that I cannot simply dismiss it.

If Nibiru is a hoax, please explain to me why have you not tried to confirm this with the media to at least drain some fear out of the many people who are falling for this hoax.

Someone has said that the Nibiru can be visible by our eyes since 15th May 2009 in south hemisphere. Someone also said that you, NASA have known this planet X, Nibiru since 1983. I really feel afraid of the end of world. Please tell me the truth!!

Why NASA is hiding facts about nibiru? It really exists beyond pluto. There is photo proof for that. It seems to me that you and NASA hide something big.

I am from Pakistan, and here the propaganda of 2012 is rising day by day. A lot of people is doing business from 2012. My question is why is NASA not condemning these hoax?

Why doesn't you and your government put a ban on the TV shows and report telecasting about Nibiru? If US can step to protect the world physically from terrorism, why can't it protect us mentally from these news, if they are hoax?

If you claim that the nibiru planet is a hoax why is there actual footage from the nasa stating that the planet exists?

I am a Russian journalist. We in this country have many people who are anxious about problem Nibiru. I know that serious scientists including in the USA do not accept Nibiru theory of Zecharia Sitchin. But tell, please, who from the scientific USA does not support even the existence of Nibiru?

I don't believe NASA. Nibiru will throw modern-day science as we know it for a loop. NASA knows it's there, but all will be revealed soon. . . . So why are you not telling the truth? Please answer me, I'm a boy, and I'm 16 years old.

If Nibiru is such a hoax then why was it on the History Channel and why don't you guys have censors for such "hoaxes" then? I have four little babies and I think all of the human race deserves to know the truth from you "experts". If it's real then do the right thing; if not quit letting these hoaxes confuse true issues please.

The Invisible Disorder

MARK DURM

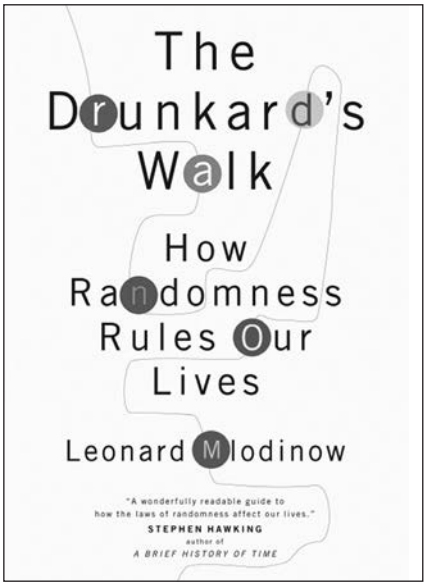
The Drunkard's Walk: How Randomness Rules Our Lives.
By Leonard Mlodinow, Pantheon Books, New York, 2008. ISBN: 978-0-375-42404-5. 252 pp. Hardcover, $24.95.

"Cicero wrote that probability is the very guide of life." So quotes Leonard Mlodinow in *The Drunkard's Walk*, which received the Committee for Skeptical Inquiry's Robert P. Balles Annual Prize in Critical Thinking (see SI, July/August 2009). Mlodinow gives readers a fascinating, informative, and practical guide to understanding this probability, this randomness of life. "The key to understanding randomness and all of mathematics is not being able to intuit the answer to every problem immediately but merely having the tools to figure out the answer," he writes. Providing these tools is Mlodinow's goal, and he achieves it. This text should be required reading for all who take a course in statistics.

Throughout the book, Mlodinow sprinkles brief biographical sketches of the great mathematicians of history—Cardano, Bernoulli, Pascal, Bayes, Fisher, Pearson, and Laplace, to name just a few. Mlodinow also incorporates the history of math itself in his writings. For example, readers learn that the symbols + and – were introduced in the 1400s, the equal sign did not exist until 1557, and the symbol for multiplication, **3**, did not appear until the 1600s.

In the chapter "Peering through the Eyepiece of Randomness," Mlodinow explains Galton's concept of regression toward the mean with student airplane pilots and their changing skill abilities. Later in the book, he explains how Galton came to this realization by measuring sweet pea seeds.

Mark Durm is a professor of psychology at Athens State University in Athens, Alabama.


The Drunkard's Walk
How Randomness Rules Our Lives
Leonard Mlodinow
"A wonderfully readable guide to how the laws of randomness affect our lives."
STEPHEN HAWKING
author of
A BRIEF HISTORY OF TIME

Mlodinow offers the three laws of probability in "The Laws of Truths and Half Truths" and uses these laws to help readers overcome misconceptions in their thinking. The proper use of these laws, Mlodinow writes, "can give us much insight into the workings of nature and the everyday world. We employ them in our everyday decision making all the time . . . [but] we don't always use them correctly."

Mlodinow gives the best and most understandable explanation of the Monty Hall problem, made famous by Marilyn vos Savant, that I have ever read. It is a pure gem among many in his book.

In a chapter titled "The Dueling Laws of Large and Small Numbers," Mlodinow explains that if a sample is large enough, it should, for the most part, reflect the population accurately (Bernoulli's golden theorem). The law of small numbers, however, is not really a law but a "misguided attempt to apply the law of large numbers when the numbers aren't large." What does this mean? We shouldn't judge a person's ability—whether corporate, executive, or athletic—on just one or two years of successes or failures.

Mlodinow goes on to recognize Faraday's contribution concerning human perception: "Human perception . . . is not a direct consequence of reality but rather an act of imagination." He relates how important it is to recognize orderly patterns when they exist but also that it is equally important not to recognize them when they are not there. "We routinely misjudge the role of chance in our lives and make decisions that are demonstrably misaligned with our own best interests." The hot hand in sports may in reality be lukewarm, and those lucky dirty socks may need washing. We, as humans, prefer to believe what we would like to be true—and many times suffer the consequences.

In the concluding chapter, Mlodinow extends the butterfly effect on atmospheric changes (a butterfly flapping its wings in Australia may set in motion wind that results in a tornado in Alabama) to the realm of human events. A momentary lapse in one's schedule may cause enough delay for that person to meet someone on the corner of a street waiting for the light to change. Fifty years later, these same two people may celebrate Christmas with their five children, ten grandchildren, and fifteen great-grandchildren, causing a tornado around the Christmas tree.

Mlodinow strongly believes "that in all except the simplest real life endeavors unforeseeable or unpredictable forces cannot be avoided, and moreover these

random forces and our reactions to them account for much of what constitutes our particular path in life." Much of the order we think we see in everyday life is not really order at all but an invisible disorder that "can be understood only through the rules of randomness."

Mlodinow writes: "Ability does not guarantee achievement, nor is achievement proportional to ability. And so it is important to always keep in mind the other term in the equation—the role of chance." So what does he offer as advice for living life? "What I've learned, above all, is to keep marching forward because the best news is that since chance does play a role, one important factor in success is under our control: the number of opportunities seized. For even a coin weighted toward failure will sometimes land on success. Or as the IBM pioneer Thomas Watson said, 'If you want to succeed, double your failure rate.'"

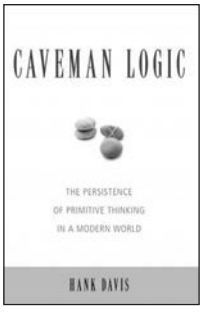
Mlodinow preaches that we should stop trying to predict these random forces of chance and learn to develop and focus qualities like flexibility, perseverance, confidence, and courage to react to them. The normal accident theory of life, he writes, does not show that the connection between actions and rewards is random but instead that random events are equally as important as one's qualities and actions.

Thus, you should double your failure rate to win more. Cicero was correct. Probability is the very guide to life. □

NEW BOOKS

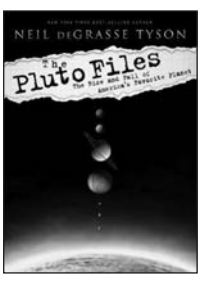
Listing does not preclude future review.

Carl Sagan: A Biography. Ray Spangenburg and Kit Moser. Prometheus Books, Amherst, NY, 2009. 181 pp. Softcover, $16.98. This concise and very readable biography of the noted astronomer and articulate science spokesman (and founding CSI fellow) comes with high praise from Sagan's wife and literary collaborator, Ann Druyan: "[This book] comes closer to the Carl I knew than other previous attempts at biography. Authors Moser and Spangenburg capture the drama, passion, and integrity of Carl's lifelong quest to know the cosmos." The authors devote separate chapters to Sagan's interest in the origin of life, the search for extraterrestrial intelligence, and his work on *Cosmos*. There are also sections on his public advocacy for science, his critical stance toward pseudoscience, and his political advocacy for the environment and safe use of nuclear power. —K.F.

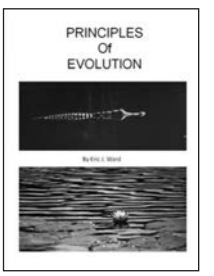


Caveman Logic: The Persistence of Primitive Thinking in a Modern World. Hank Davis. Prometheus Books, Amherst, NY, 2009. 298 pp. Softcover, $19.95. An award-winning professor of psychology (University of Guelph) laments that while science offers a wealth of explanations for natural phenomena, we often prefer to embrace the fantasies that comforted our ancient ancestors. We'll even go to war to protect our delusions against those who don't share them. Davis apologetically uses the metaphor of the caveman as a symbol of "our less-rational, more-superstitious self." Why are we so illogical, and why do we reach similar superstitious conclusions the world over? He examines both of these questions and finds the answers rooted in his field of evolutionary psychology, which attempts to understand humans as part of the biological world in which they evolved. —K.F.

Exposed! Ouija, Firewalking, and Other Gibberish. Henri Broch. Foreword by Georges Charpak. Translated by Bart K. Holland. Johns Hopkins University Press, Baltimore, MD, 2009. 168 pp. Hardcover, $24.95. French physicist and CSI fellow Henri Broch presents his second book succinctly examining pseudoscientific claims. Broch, coauthor of the earlier *Debunked! ESP, Telekinesis, and Other Pseudoscience* (also Johns Hopkins), gamely tackles additional topics: dowsing, clairvoyance, deceptive techniques in argument, astrology and horoscopes (including the Mars and Saturn effects), alleged miracles (such as the shroud of Turin) and religious artifacts, alleged self-developed powers such as walking on coals, the supposed life-energy force qi, measuring the "vital force," and other supposed mysteries. Nobel laureate physicist Georges Charpak, with whom Broch coauthored *Debunked!*, calls Broch's work in hunting down obscurantism in the field of physical science "a great step toward the preservation of the inherent right to human reason." —K.F.



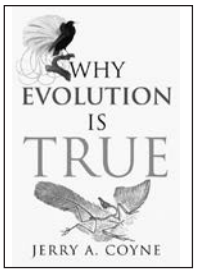
The Pluto Files: The Rise and Fall of America's Favorite Planet. Neil DeGrasse Tyson. W.W. Norton, New York, 2009. 194 pp. Hardcover, $23.95. Astrophysicist, author, and CSI fellow Tyson (director of the American Museum of Natural History's Hayden Planetarium) took tons of flack when (by simply reclassifying planetary bodies for a new exhibit) he helped play a role in the eventual demotion of Pluto from planet to plutoid. This is his congenial, amusing, and occasionally bemused account of what happened, including the vociferous reactions of school kids who regretted that their favorite planet was seemingly being taken away. It was a good learning opportunity for all, and Tyson tells the story in pleasurable fashion. —K.F.



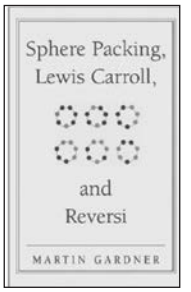
Principles of Evolution. Eric J. Ward. www.principlesofevolution.com, 2009. 129 pp. Softcover, $15.95. This succinct, nicely designed book offers readers a good understanding of the basic principles of evolution with as little distraction as possible. It is intended for young people and adults who have not had the opportunity to learn about the subject or want to clarify their understanding. For a self-published book, this one has surprisingly good production values, including more than 150 color photos and short boxes and charts. —K.F.

The Psychology of Paranormal Belief: A Researcher's Handbook. Harvey J. Irwin. Foreword by Caroline Watt and Richard Wiseman. University of Hertfordshire Press, Hatfield, Hertfordshire, U.K., 2009. 213 pp. Softcover, £16.99/US$34.95. Irwin presents a thorough and systematic review of empirical investigations into the bases of belief in paranormal phenomena from a psychological perspective. The audience is primarily academic, but nonacademics should find this a valuable reference as well. After discussing the social and cultural influences of paranormal belief and the metrics of such belief (widespread in most societies), Irwin, an internationally renowned researcher in the field, examines four main theoretical approaches to understanding its nature: the social marginality hypothesis, the worldview hypothesis, the cognitive deficits hypothesis, and the psychodynamics hypothesis. The book contains a forty-eight-page bibliography, fourteen appendices, and detailed indexes. —K.F.

Why Evolution Is True. Jerry A. Coyne. Viking, New York, 2009. 282 pp. Hardcover, $27.95. Many important books have examined the evolution/creationism controversy (a social and cultural phenomenon, not a scientific one) but University of Chicago evolutionary biologist and writer Coyne provides a succinct and accessible summary of the facts supporting Darwinian evolution by natural selection. In the introduction Coyne asks: Why do we need a book that gives the evidence for a theory that long ago became mainstream science? We don't write books explaining evidence for atoms or the germ theory of disease. What is so different about evolution? "Nothing—and everything," he writes. The stark public resistance stems largely from religion. He feels good information can be helpful to thoughtful people—"the many who find themselves uncertain, or who accept evolution but are not sure how to argue their case." And, like Darwin, he finds the evolutionary perspective ennobling. As a result he skillfully weaves together the many threads of modern work in genetics, paleontology, geology, molecular biology, anatomy, and development that demonstrate the "indelible stamp" of evolution. —K.F.



Sphere Packing, Lewis Carroll, and Reversi. Martin Gardner. Cambridge University Press, New York, 2009. 282 pp. Softcover, $14.99. The indomitable Martin Gardner is back with his latest installment of The New Martin Gardner Mathematical Library. Previous books include *Hexaflagons, Probability Paradoxes, and the Tower of Hanoi* and *Origami, Eleusis, and the Soma Cube*. These collections of Gardner's *Scientific American* columns have been revised and updated for today's readers and include many new illustrations. Here the celebrated polymath tackles nearly two dozen mathematical games and puzzles, including a chapter on the games and puzzles of Lewis Carroll, the four-color map theorem, cutting polygons, and the puzzles of pi. —B.R.



When Angels Touch: A Journey to the Clouds. Tom Lumbrazo. BAEB Publishing, Brentwood, California, 2009. 234 pp. Hardcover, $29.95. This curious book is a collection of over two hundred full-color photographs of clouds. Each page has a photo of a cloud formation and a caption beneath it, such as "Unicorns Can Be Sexy Too" and "I'm Just a Little Puppy Dog." The author is not a meteorologist but simply an amateur photographer with a vivid imagination. Some of his interpretations are humorous and others are very straightforward, but all of them have a real meaning to the author, who notes, "There is no doubt that the cloud designs that have been captured in this book could not be a coincidence. In my opinion, there must be intelligence at work to configure the clouds in these ways." Yes, he believes that some intelligence or higher power is literally sending messages to humanity through clouds of various shapes. The book serves as an interesting case study in one man's (very sincere) pareidolia. —B.R.

—Kendrick Frazier and Benjamin Radford

LETTERS TO THE EDITOR

LAKE CRESCENT MONSTER | NEW JERSEY UFO HOAX REVEALED | HYPING HEALTH RISKS
Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
Volume 33, No. 4 • July / August 2009
THE HOBBIT DISCOVERY
SCIENCE & CONTROVERSY
Careful Phrasing: How Words Influence Research
I Ching: Ambiguity & Obscurity
Chiropractic Dangers and Informed Consent
The Indigo Children: Saviors or New Age Bunkum?
CFI Twelfth World Congress
Published by the Committee for Skeptical Inquiry

The Hobbit Controversy

The discovery of the hominin fossils on the island of Flores in 2003 was indeed fascinating. Your article "Pathology or Paradigm Shift? Human Evolution, *Ad Hominem* Science, and the Anomalous Hobbits of Flores" (SI, July/August 2009) was the most balanced and intelligent treatment of the subject I've seen yet. Although not a scientist, I have always been interested in human evolution. Thanks for stimulating the brain cells!

Marc S. Russo
Brooklyn, New York

You invited comment on your decision to diverge from your general field of interest and publish an article about the controversial anthropological discovery on Flores a few years ago. For me, that was one of your best articles ever. I thoroughly appreciate being brought up to date on the interpretation of that amazing discovery and the difficulties involved in deciding exactly where these creatures fit into the broad picture of evolving humans that has unfolded over the last 150 years.

I also heartily welcome your shift in editorial direction. I dare say very few of your subscribers are looking for any more evidence against ghosts, astrology, psychics, and the like. A discussion of the range of perspectives offered by scientists on a difficult subject, in my view, falls clearly within your mandate.

One suggestion along this new line would be a skeptical treatment of the prevailing rosy expectation that we will someday hear from intelligent beings somewhere else in space. If your readers knew how minuscule the likelihood is of some intelligence in space being close enough for communication at the speed of light, actual physical visits from space aliens would become unthinkable, and articles about UFOs would finally cease.

Don Keith
Waterloo, Ontario

Just a quick message about your article on the *H. floresiensis* debate in the SKEPTICAL INQUIRER. It is up to date, extremely informative, well-balanced, and beautifully written.

Serious congratulations!

Dean Falk
Hale G. Smith Professor of Anthropology
Florida State University
Tallahassee, Florida

Could the argument over *H. floresiensis* be succinctly characterized as add hominin *ad hominem*?

David Fischer
Milwaukee, Wisconsin

Indigo Children?

I read with interest your article on the so-called Indigo children ("Seeing the Indigo Children," SI, July/August 2009). My appraisal of the ten most common traits that supposedly characterize these *wunderkinder* suggest to me another, more time-honored designation: spoiled brats.

I would submit that the Indigo children movement is merely an exercise in self-serving rationalization on the part of New Age yuppies in order to excuse their bad parenting skills.

Rick Schroeder
West Yarmouth, Massachusetts

Unfortunately, during the '80s and '90s when, due to kindergarten IQ tests, more people began to realize that there were many "gifted" children, the psychics, mediums, and assorted fanatics grabbed on to a gold mine. It is similar to the therapists who exploited the False Memory Syndrome twenty years ago and destroyed the lives of thousands of families. The past twenty years, from my seventieth to nintieth year, I have worked as a volunteer mentor for hundreds of children, both gifted and with various types of learning and emotional problems. They are two entirely different situations.

I have never met a gifted child who claimed to be clairvoyant or have any extrasensory capabilities. They are smart, rational, and eager to learn but usually bored because they are so far ahead of their classmates. Sadly, many of them lose interest in school because, due to budget limitations and government interference, we cannot give them the skilled teachers and time to challenge them with an advanced curriculum.

I have read most of the books you listed, but the best, I think, you did not list. It is *Niños Índigo* by Gabriel Sánchez.

Robert N. Rader
Lake Placid, Florida

Out of necessity, writers and editors have to hew to standards of politeness, so they cannot in good conscience, as readers can, refer to believers in Indigo children as superstitious nitwits. I can and do.

The list of characteristics typical of Indigo children struck me as indicative of a generation of children raised in comfortable, spoiled, upscale environments in which the luxury of self-obsession flourishes. No wonder there are so many of them.

Finally, my favorite sushi bar is called "Ai," which is Japanese for "indigo." Perhaps this explains why I leave the place with a feeling of higher consciousness.

Keep up the great work!

Fred Glienna
South Pasadena, California

Indigo children as the next evolutionary stage? Bah! They have already been surpassed. We ultraviolet people are more energetic, penetratingly perceptive, blindingly brilliant, and our auras are invisible. You will never know we are among you.

John W. Hill
River Falls, Wisconsin

Dangers of Chiropractic

Your July/August 2009 issue was an unusually excellent issue presenting many fine articles. Of specific interest to me was Samuel Homola's essay, "Chiropractic Neck Manipulation and Informed Consent," inasmuch as he faces the enmity of his fellow chiropractors by exposing this danger. I was a pathologist for more than forty years, during which I had personal knowledge of several deaths that occurred after neck manipulation apparently caused compression/rupture of the vertebral arteries in individuals with incomplete circles of Willis (the uniting vascular system between carotid and vertebral supply). The district attorney was asked to bring murder charges against one of the chiropractors but demurred, stating that the individual was "acting within the scope of his professional knowledge."

His statement raises several germane issues: Is there a valid indication for neck manipulation of the type taught at Palmer Method institutions? Is chiropractic a valid healing profession? What defect or illness does chiropractic aim at healing?

The common answer to the last question is "the treatment of a subluxation of the vertebrae." This imaginary entity, the subluxation, occupies a position similar to the UFO among thoughtful scientists and individuals. An anatomist at the University of California, San Francisco, attempted to cause subluxations by dropping cadavers down a four-story stairwell. He was never able to generate one. Radiologists I have questioned have also never found one on a proper X-ray or scanned image. I have never seen one in thousands of autopsies. There is, in fact, no scientific evidence that this putative cause exists at all. Nor is there any evidence that pressure on a nerve, due to such an imaginary defect, might cause the laundry list of diseases chiropractors attribute to this imaginary event. These facts tend to answer the other two questions: because there is no valid pathogenesis or etiology of *any* disease that includes a causative subluxation, nothing can be healed by manipulation aimed at removing it. Therefore, the entity chiropractic exists not from a science-based need but rather because of a torrid and persistent lobby and a hapless public.

A "licensed" physician in our county was charged with manslaughter and sent to jail because he performed a procedure for which he had neither skill nor proper scientific training. Chiropractors across the land must be doing this daily. People take innocent children to chiropractors; "treated" by outright quackery, these children, sometimes infants, are put at risk without informed consent. I realize the wisdom of Mencken's homily: "No one has ever gone broke underestimating the intelligence of the average American."

Thank you for your own efforts to estimate your reader's intelligence.

Jack Leissring, MD
Santa Rosa, California

The I Ching

Charles Sullivan is right when he says that the I Ching is similar to the advice given in a book of English proverbs (as well as astrology—the alignment of the planets compared to the tossing of three coins), but he is wrong in concluding that good advice and preventive warnings from these ancient sources are harmful, as they apply to everyone in different degrees ("What's Wrong with the I Ching?" SI, July/August 2009).

As Shakespeare so aptly put it, "The fault, dear Brutus, is not in our stars but in ourselves." "Knowing ourselves" is becoming aware that we don't handle either criticism or good advice gracefully. In fact, we are in the habit of killing the messenger, both figuratively and literally.

It is our abhorrence of hearing the truth that shuts down critical thinking. There is nothing mysterious (or mystical) about the enlightening experience that wakes us up to reality. It serves to prove that our reasoning mind, the latest addition to our evolving brain, is our new survival instinct.

Scientists are currently sitting on the evidence given to them by Dr. Daniel G. Amen's conclusive studies using SPECT

scans. He has proven that the less activity in our prefrontal cortex, the less rationally we think and behave.

Joan Morrone
Sebring, Florida

I was disappointed to read Charles Sullivan's superficial article about the I Ching (Yijing, *Book of Changes*). The article seems to be directed at a hypothetical group who use the I Ching in a literal-minded way to make important decisions. Perhaps some people do, but my experience suggests that for most who are interested in the *Changes*, the motivation is to understand ways of thought very different from those of the modern world. Particularly unfortunate is Sullivan's remark that the "words of advice . . . appear to be no more illuminating than the words of advice found inside fortune cookies." Yes, the language is obscure—hardly surprising since the earliest textual layers are nearly 3,000 years old and are expressed in words whose meanings have undergone radical change.

The changing ethical and philosophical interpretations of the I Ching during three millennia provide a window into the historical development of Chinese thought. While it is plausible that the cosmology of the *Changes* and its commentaries inhibited the development of Chinese science by providing noncausal explanations of natural phenomena, as I (in *Science and Asian Spiritual Traditions*, Greenwood Press 2007) and others have proposed, the *Changes* is of great interest in understanding the development of the ways humans have sought to find coherent patterns in the ever-changing universe.

Geoffrey Redmond, MD
New York, New York

Astrology, Evolution, and Abortion Polls

Alan Orenstein ("On Evolution, Abortion and Astrology," SI, July/August 2009) is surprised that people who don't believe in evolution and oppose abortion rights consult horoscopes less than those who do believe in evolution and support abortion rights. As he says, this is opposite to what most of us would expect.

A very simple possibility for the data is that more of the former group just don't read newspapers and magazines at all, so of course they don't see horoscopes.

Edgar Pearlstein
Lincoln, Nebraska

I found the relationships between religion, the strength of scientific belief, and whether or not a person reads a horoscope interesting. It did occur to me though that a more direct relationship would be found by asking slightly different or additional questions. "Do you read the horoscope occasionally or regularly?" and "Do you take the horoscope seriously or read it for entertainment value?" have both been addressed in passing in the article. These two answers are needed in order to ask the questions that were missed, which I believe would tie it all together in a nice package: "Do you believe in coincidence?" followed by "If so, how strongly do you believe in it?" Just from my own experience, I think you will find a very high correlation between those who read horoscopes seriously and regularly and belief in strong coincidences.

Carl Powell
Newport News, Virginia

The data adduced by Alan Orenstein do indeed show that those who attend church frequently and do not believe in evolution are far less likely to use astrology than others. However, his interpretation of the observation "that commitment to a church inoculates people against exploring other belief systems" is an untested speculation. The data could just as well be interpreted as showing that those who are not gullible enough to believe in a theory that purports to be scientific but violates known laws of science (the law of biogenesis, the second law of thermodynamics) are less likely to be gullible enough to believe in astrology.

John Tors
Toronto, Ontario

I cannot understand why, having acknowledged that a poll question concerning astrology was "less cleanly worded" than it might have been, Alan Orenstein proceeds to build his entire argument on the data resulting from that question. "Less cleanly worded"? Try "so ambiguous as to actually be meaningless." The question was "Do you ever read a horoscope or your personal astrology report?" As Orenstein himself admits, it is impossible to tell from this question alone whether a person responding "yes" is a firm believer in astrology or just someone who occasionally glances at her horoscope for amusement. But if you wish to draw conclusions from these data about the extent to which science can replace religious commitment, it is surely essential that you know something about the respondents' actual attitudes toward astrology. Does looking at a horoscope take the place of reading the Bible or going to church, or is it more like opening a fortune cookie? Without knowing this, it is impossible to draw any firm conclusions about the significance of people reading—not "consulting," as Orenstein repeatedly says—their horoscopes.

Suppose you polled a group of well-educated atheists, and one of your questions was "Do you ever read the Bible or other sacred texts?" I'm fairly certain a substantial number would answer "yes." If we followed Orenstein's logic, we would have to conclude that atheists are turning, in alarming numbers, to religion.

Christopher Baum
Astoria, New York

I found it rather ironic that the conclusion by Alan Orenstein that a decline in religious belief and a strengthening of scientific training and knowledge will not save us from the increasing use of astrology and other such foolish belief systems was based on a poll in which an admittedly ambiguous question was used about the use of astrology, which may well have influenced the participants' answers. "Do you ever read a horoscope or your personal astrology report?" Based on that, I would have to answer in the affirmative, as I have been known to read through a horoscope column in a newspaper if I'm significantly bored at work and such a thing is handy, but I have absolutely no belief in the truth or validity of such a thing.

The irony comes in when one considers that the article immediately following, entitled "Careful Phrasing: A Matter of Life and Death" by Danny Helman, concludes that "using such an ambiguous term in research leaves any finding open to future objections, arguments, and doubts."

Surely the same thing must be said of basing one's conclusions on a poll that uses ambiguous wording in one of the questions under consideration.

Kerwin L. Schaefer
New Bern, North Carolina

The way the question regarding reading one's horoscope is worded, I'm surprised the response wasn't close to 100 percent. As Alan Orenstein pointed out, the question doesn't differentiate between a person who happens to glance at the horoscope once a year by chance and folks who actively hunt down any and

all astrological material. If I were to answer honestly, I would have to say "Yes, I read mine." Sometimes when working a Sudoku in the paper, I'll glance at the horoscope adjacent to the puzzle, if for no other reason than to reaffirm how silly the thing is. Do I look for it or read the thing regularly? No.

Also in a recent issue, there were some results from a question regarding UFOs. Again, from the wording ("Have you ever seen a UFO?") almost everyone, it seems, would have to answer "yes." From the dictionary definitions of the words *unidentified*, *flying*, and *object*, any airplane whose airline logo or FAA registration number is not visible while in flight is, well, unidentified. Does a "yes" answer imply a person is a believer in flying saucers and the like? I don't think so. Again, in my humble opinion, the question will lead to ambiguous and essentially useless results. The next article in the July/August 2009 SI, by Danny Helman, talks about the need for clear and unambiguous statements when writing. Obviously, this must apply to all survey questions as well if the survey is to be at all meaningful.

It is for these reasons that I put very little stock in most survey results. It is well known that results can vary depending on how the questions are worded, and those that are as loosely worded as the example in Orenstein's article will lead to totally useless results.

F. Jack Eastman
fjackeastman@yahoo.com

I look at a newspaper horoscope a few times a year for entertainment. I am an atheist and a skeptic. How would I be counted? Orenstein notes: "Admittedly, this is a less cleanly worded item. . . . Despite these lacunae, the percentage who said 'yes' . . . is unsettling." These "lacunae" are large enough to drive a truck through.

Richard Allphin
Jamestown, Rhode Island

I've been reading the SKEPTICAL INQUIRER for too many years. I'm becoming skeptical of the skeptics.

Alan Orenstein comments: "Can science replace religious commitment, as skeptics hope? If this were so, we should find that a belief in science suppresses the exploration of alternative belief systems, just as religious commitment does." Isn't it highly unlikely that a discipline that demands an exploration of demonstrable truths would suppress the exploration of alternative beliefs—even in the supernatural—held by those whose world views differ from those of the scientific community? Moreover, have you ever tried to change the beliefs of an unquestioning believer, not only in religion but in anything? It's just not going to happen.

Barbara Todd
Pensacola, Florida

Alan Orenstein replies:

What most of these comments on my article have in common is a distrust of the question I used from the General Social Survey (GSS). It asked: "Do you ever read a horoscope or your personal astrology report?" The problem that was most mentioned is that it includes too many people who can say "yes," even when they do not believe in astrology at all and are only seeking entertainment. I think these commenters would prefer a question such as the following: "As an adult, have you ever . . . consulted a horoscope to get an idea about the course of your life." This is a more limiting question because it specifies when the horoscope was consulted (as an adult) and that it was done for a serious purpose (to learn about one's life) and not merely as play. The critics are right that this second question, from the 2005 Baylor Religion Survey (available at http://thearda.com), produces many fewer "yes" responses; only 26.6 percent of the Baylor national sample of over 1,600 said "yes" compared to 57.6 percent who said "yes" on the GSS national sample.

However, this difference in number does not seem to affect the results. Because there is no single abortion question on the Baylor survey, I combined six items to measure abortion attitudes. The combination of frequent church attendance and strong antiabortion attitudes in the Baylor survey is associated with a reduced use of astrology; only 11.8 percent said "yes" compared to 32.4 percent, 35.2 percent, and 22.6 percent in the other three comparison groups. Asked how they feel about sexual relations "between two adults of the same sex" (which I used as a substitute measure because there is no evolution item on the Baylor survey), the combination of frequent church attendance and strong disapproval of homosexuality reduces astrology use to 11 percent compared to 32 percent, 37 percent, and 30 percent in the other three subgroups. Church attendance alone or conservative attitudes alone have a less protective effect. The important point is that these two forms of the question about consulting horoscopes produce a nearly identical pattern of results. The Baylor survey does not have specific education questions, so I cannot use it to test the other hypothesis in my paper.

Since social scientists normally validate their questions by seeing whether different measures of the same variable produce similar results, I doubt that the GSS question is as useless as these critics contend. If it is so contaminated by entertainment-seekers, I fail to understand why the GSS item had such clear relationships with a number of other variables in the original paper, which none of the writers try to explain (although Mr. Pearlstein suggests a hypothesis that could be tested if either survey had asked about newspaper readership). As I implied in the article, I would have liked a more specific question too, mainly to learn how much of the church's effect is among true paranormal believers and how much among entertainment-seekers, since I think it would be no small achievement for the church to be able to affect behaviors that the participants regard as nonconsequential entertainment. In sum, I am not persuaded that there is any reason to change my previous conclusions about the effects of religion and education on paranormal belief.

The letters column is a forum for views on matters raised in previous issues. **Letters should be no longer than 225 words.** Due to the volume of letters we receive, not all can be published. Send letters as e-mail text (not as attachments) to letters@csicop.org. In the subject line, provide an informative identification, e.g.: "Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122, or fax it to 505-828-2080.

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THE LAST LAUGH

BENJAMIN RADFORD, Editor

ONLINE EXTRA! To see more skeptical humor from The Last Laugh, visit **www.csicop.org/SIExtras.**

HIDDEN MESSAGES by Dave Thomas

The following letters are a simple substitution cipher. If R stands forL, it will do so everywhere. Solution is by trial and error. Hint: Look for patterns in words: for example, the scrambled phrase "JRXJ JRQ" might represent "THAT THE."

PUZZLE

"TEGHZ SEI WD NDTGBDN WCGDTFI EK EB GFFQPGMEF WDFGDT GBHZD QMMACCDBMD QT HZD GSLCQWEWFD." — Z. F. SDBMXDB

CLUE: L = P

ANSWER KEY

As you decipher letters, keep track of them with the handy answer key below. If you've decided that R stands for L, simply write down an "L" above or below the "R" in the alphabetized row below, just as you would for the cipher itself. This builds a handy, easy-to-use reference guide for you and will also reveal the "Super Secret Word," a puzzle within a puzzle!

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

PREVIOUS PUZZLE SOLUTION: *"THE RELIGION THAT IS AFRAID OF SCIENCE DISHONORS GOD AND COMMITS SUICIDE."— RALPH WALDO EMERSON*
SUPER-SECRET WORD: COWERING

Pablo's Picks

Twelve magazine titles once seriously considered, then soundly rejected, by the SKEPTICAL INQUIRER staff:

1. ***Saturday Evening Ghost***
2. ***Pseudoscientific American***
3. ***Modern Bunk***
4. ***Skepticalifragilisticexpicalidocious***
5. ***Swindlers' List***
6. ***ScamWow!***
7. ***National Rational***
8. ***No-It-Alls***
9. ***Popular Pseudo-Science***
10. ***Dogma World***
11. ***The Kurtz Kronicles***
12. ***@$%&# People***
13. ***Kooks Illustrated***

Rob Pudim

Astrological Truth in Labeling

Brian Oakes (drawpeopleface@yahoo.com)

"Okay, fine, Mr. Skeptic: Even though ghosts have never been proven to exist, I have spoken to and identified four types of spirits and apparitions."

Gary Bauslaugh, editor, *Humanist Perspectives*, Victoria, B.C., Canada
Richard E. Berendzen, astronomer, Washington, D.C.
Martin Bridgstock, Senior Lecturer, School of Science, Griffith University, Brisbane, Australia
Richard Busch, magician/mentalist, Pittsburgh, Penn.
Shawn Carlson, Society for Amateur Scientists, East Greenwich, RI
Roger B. Culver, professor of astronomy, Colorado State Univ.
Felix Ares de Blas, professor of computer science, University of Basque, San Sebastian, Spain
Sid Deutsch, engineering consultant, Sarasota, Fla.
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Thomas R. McDonough, lecturer in engineering, Caltech, and SETI Coordinator of the Planetary Society
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TEXAS. North Texas Skeptics NTS Dallas/Ft Worth area, John Blanton, Secretary. Tel.: 972-306-3187; e-mail: skeptic@ntskeptics.org. PO Box 111794, Carrollton, TX 75011-1794 US. www.ntskeptics.org.

VIRGINIA. Science & Reason, Hampton Rds., Virginia. Lawrence Weinstein, Old Dominion Univ.-Physics Dept., Norfolk, VA 23529 US.

WASHINGTON. Society for Sensible Explanations, Western Washington. Tad Cook, Secretary. E-mail: K7RA@arrl.net. PO Box 45792, Seattle, WA 98145-0792 US. http://seattleskeptics.org.

WISCONSIN. Madison Skeptics, Jennifer Bunner, Co-Founder. 2111 Carver Street, Madison, WI 53713. E-mail: madisonskeptics@gmail.com.

PUERTO RICO. Sociedad De Escépticos de Puerto Rico, Luis R. Ramos, President. 2505 Parque Terra Linda, Trujillo Alto, Puerto Rico 00976. Tel: 787-396-2395; e-mail: Lramos@escepticospr.com; Web site www.escepticor.com.

The organizations listed above have aims similar to those of the Committee for Skeptical Inquiry but are independent

International groups listings have been moved to our Web site: www.csicop.org

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